Vol. 919 Number 1

OFFICIAL GAZETTE

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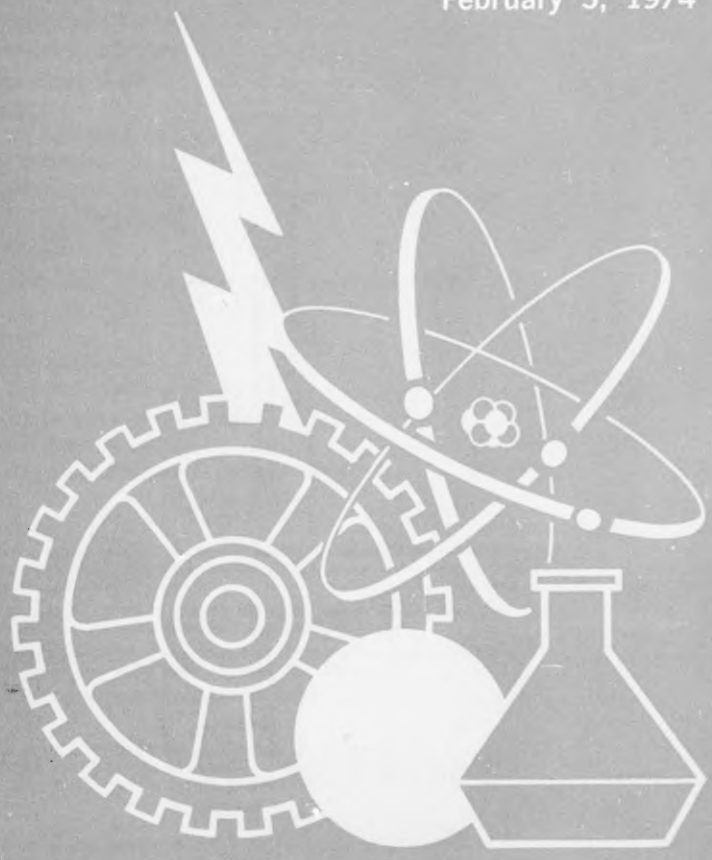
PATENTS

February 5, 1974



U. S. DEPARTMENT OF COMMERCE
Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

February 5, 1974 Volume 919 Number 1

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PATENT OFFICE NOTICES

Registration to Practice

The following list contains the names of persons applying for registration to practice before the U.S. Patent Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents on or before February 15, 1974.

Glassman, Jeremiah, 712 S. Pitt St., Alexandria, Va. 22314
Hensley, Max D., 3279 S. Stafford, Arlington, Va. 22206
Morse, Wayne A., Jr., 103 N. French St., Alexandria, Va. 22304
Oremland, Lawrence R., 1111 Leader Bldg., Cleveland, Ohio 44114
Sakovich, Michael M., P.O. Box 957, Sta. B., Ottawa, Canada
Toth, Victor J., 11701 North Shore Drive, Reston, Va. 22090
Woodley, John H., 133 Richmond St. W., Toronto, Canada.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Closing of Patent Office on December 24 and 31, 1973

In view of the provisions of Executive Order 11750, issued December 13, 1973, for excusing employees of all executive departments, independent establishments, and other governmental agencies from duty on Monday, December 24, 1973, and Monday, December 31, 1973, and for consideration of those days as falling within the scope of Executive Order 11582 and 5 U.S.C. 5546 and 6103(b), each of those days constitutes "a holiday within the District of Columbia" under the provisions of 35 U.S.C. 21. Any action due in the Patent Office on December 24, 1973, is to be considered timely if taken on December 26, 1973, and any action due in the Patent Office on December 31, 1973, is to be considered timely if taken on January 2, 1974.

RENE D. TEGTMEYER,
Dec. 17, 1973. *Acting Commissioner of Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,025,774, H. G. Bush, ACCESS AND PROTECTIVE COVER FOR VALVES, METERS, MANHOLES AND THE LIKE, **filed** Apr. 12, 1973, D.C., S.D. Calif. (San Diego), Doc. 73–142–S, *Brooks Products, Inc.* v. *Peterson Concrete, Inc. and South Bay Foundry Incorporated.* Defendants perpetually enjoined from infringing said patent, July 17, 1973.

3,072,582, C. B. Frost, POLYETHER-URETHANE FOAMS AND METHOD OF MAKING SAME, **filed** July 12, 1973, D.C. Del. (Wilmington), Doc. 4688, *Olin Corporation* v. *The General Tire & Rubber Company.*

3,201,855, B. F. Hay, ELECTRICAL RESISTOR AND METHOD OF MAKING SAME; **3,206,704,** same, ELECTRICAL RESISTOR; **3,295,090,** same, ELECTRICAL RESISTOR HAVING A CORE ELEMENT WITH HEAT DISSIPATING PROPERTIES; **D. 201,884,** Blake and Rakowsky, RESISTOR HOUSING OR SIMILAR ARTICLE, **filed** June 13, 1973, Ct. of Appeals, Mass. (Boston), Doc. 73–1203, *Dale Electronics, Inc.* v. *R.C.L. Electronics, Inc.* **Same, filed** June 13, 1973, Ct. of Appeals, Mass. (Boston), Doc. 73–1204, *Dale Electronics, Inc.* v. *R.C.L. Electronics, Inc.*

3,206,704. (See 3,201,855.)

3,234,317, H. R. Henderson, SWIVEL COUPLING FOR A COMBINED FLUID CONDUIT AND ELECTRIC CABLE; **3,573,419,** same, CUTTING AND GOUGING TORCH, **filed** July 12, 1973, D.C., N.D. Tex. (Dallas), Doc. CA–3–7401–E, *Arcair Company* v. *James T. Jeter, Jr. et al.*

3,197,710, H. C. Lin, COMPLEMENTARY TRANSISTOR STRUCTURE; **3,237,062,** B. T. Murphy, MONOLITHIC SEMICONDUCTOR DEVICES, **filed** July 29, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1862, *Westinghouse Electric Corp.* v. *Texas Instruments Inc.* Stipulation: parties ordered cause dismissed without prejudice, counterclaims dismissed, July 9, 1973.

3,237,062. (See 3,197,710.)

3,275,461, Davies and Havranek, REFRACTORY, **filed** Aug. 21, 1969, D.C., N.D. Ohio (Toledo), Doc. C69–643, *Dresser Industries, Incorporated* v. *Basic Incorporated.* Cause dismissed with prejudice, July 10, 1973.

3,295,090. (See 3,201,855.)

3,301,040, Levy, Herk, Stahl, and Lawrey, AUTOMATIC FRACTION COLLECTING SYSTEM FOR VAPOR PHASE CHROMATOGRAPHY, **filed** July 16, 1973, D.C., E.D. Pa. (Philadelphia), Doc. C.A. 73–1602, *David M. G. Lawrey et al.* v. *Perkin-Elmer Corp.*

3,415,292, G. S. Ericson, COIL WINDING AND TRANSFER APPARATUS FOR DYNAMOELECTRIC MACHINE CORE MEMBERS, **filed** June 26, 1973, D.C., N.D. Ind. (Fort Wayne), Doc. 73–F–52, *Essex International, Inc.* v. *Industra Products, Inc.*

3,426,134, Shema, Reilly, and Kubasko, SLIMICIDAL COMPOSITION AND METHOD, **filed** July 11, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c1783, *Betz Laboratories, Inc.* v. *Diamond Shamrock Corporation, doing business as Diamond Shamrock Chemical, Nopco Chemical Division.*

3,432,793, Muska, Schacker and McHattie, GROUNDING CONNECTION FOR ELECTRICAL UNIT, **filed** June 15, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–1368–F, *William A. Muska et al.* v. *Sierra Electric, Division of Sola Basic Industries.*

3,484,121, W. E. Quinton, CANNULA EXTENSION AND CONNECTOR APPARATUS; **Reg. No. 888,757** (STERI-LOK), Quinton Instrument Co., **filed** June 8, 1970, D.C., W.D. Wash. (Seattle), Doc. 9013, *Quinton Instrument Co.* v. *Sweden Freezer Manufacturing Co. and Harvey F. Swenson.* Consent decree entered, June 8, 1973.

3,510,066, E. W. Swenson, SPREADER APPARATUS, **filed** July 6, 1973, D.C., S.D. Ill. (Springfield), Doc. S–C–73–136, *Swenson Spreader & Mfg. Co.* v. *Baughman Manufacturing Company, Inc.*

3,524,451, J. D. Fredrickson, PROCESS FOR INCREASING THE FILLING CAPACITY OF TOBACCO; **3,524,452,** Moser and Stewart, same, **filed** July 10, 1973, D.C., M.D.N.C. (Greensboro), Doc. C–214–G–73, *Reynolds Leasing Corporation* v. *American Brands, Inc.*

3,524,452. (See 3,524,451.)

3,567,029, B. A. Quame, COLUMN FOR TESTING BIOLOGICAL FLUIDS, **filed** July 13, 1973, D.C., N.D. Calif. (San Francisco), Doc. C–73–1206 SAW, *Bio-Rad Laboratories* v. *Brinkman Instruments, Inc.*

3,573,419. (See 3,234,317.)

3,602,442, C. E. Wenninger, SAND-MULLING APPARATUS; **3,666,243,** A. J. Bisinella, SAND MULLING OR CONDITIONING APPARATUS AND PLOW CONSTRUCTION THEREFOR, **filed** May 31, 1973, D.C., E.D. Mich. (Detroit), Doc. 40200, *Pettibond Corporation* v. *Fargo Machine & Tool Co.*

3,613,044, W. G. Rarick, POWER SUPPLY CORD HATCH, **filed** Dec. 11, 1972, D.C., N.D. Ind. (South Bend), Doc. 72S248, *Lyall Electric, Inc.* v. *America Sales Co., Inc. and Guy P. Bassi.* Consent judgment: defendants have infringed; permanently enjoined against infringing, entered July 6, 1973.

3,634,864, J. Trachtenberg, ANTENNA FOR USE WITH AN AUTOMOBILE, **filed** June 23, 1972, D.C.N.J. (Trenton), Doc. C–1076–72, *Interdynamics, Inc.* v. *Budge Mfg. Co., Inc.* Consent judgment in favor of plaintiff, July 19, 1973.

3,666,243. (See 3,602,442.)

D. 201,884. (See 3,201,855.)

Reg. No. 888,757. (See 3,484,121.)

Certificates of Correction for the Week of Feb. 5, 1974

P.P. 3,344	3,730,013	3,752,978
3,346,062	3,731,000	3,753,199
3,560,725	3,732,145	3,755,145
3,635,802	3,733,324	3,755,740
3,674,124	3,734,710	3,757,008
3,674,783	3,735,188	3,757,087
3,680,133	3,736,229	3,757,139
3,686,899	3,737,786	3,757,743
3,690,420	3,739,136	3,759,828
3,697,511	3,739,137	3,760,745
3,699,218	3,739,766	3,760,950
3,703,375	3,743,687	3,761,314
3,705,562	3,745,017	3,761,726
3,711,154	3,747,479	3,762,068
3,715,858	3,747,598	3,762,880
3,720,986	3,748,323	3,763,005
3,727,565	3,748,885	3,763,066
3,727,689	3,749,892	3,763,257
3,727,756	3,750,463	3,764,524
3,728,839	3,750,982	3,764,628
3,729,389	3,751,385	3,764,776
3,730,007	3,751,515	3,764,934

Dedications

3,672,036.—*John P. Ziemianski*, Avonmore, Pa. METHOD OF MAKING ASSEMBLIES OF STAINLESS STEEL TUBING. Patent dated June 27, 1972. Dedication filed Oct. 24, 1973, by the assignee, *Allegheny Ludlum Industries, Inc.*

Hereby dedicates to the Public the entire term of said patent.

3,720,936.—*Abed G. Kahale*, Roselle, *Kenji Yatsushiro*, Chicago, and *Thaddeus S. Wielgos*, Des Plaines, Ill. WARNING SIGNAL RELAY AND SYSTEM. Patent dated Mar. 13, 1973. Dedication filed Oct. 23, 1973, by the assignee, *Controls Company of America.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers and Dedications

3,191,421.—*Aldo L. Coen*, Chicago, Ill. METHOD OF MAKING LOUD SPEAKER FIELD STRUCTURE. Patent dated June 29, 1965. Disclaimer and dedication filed Aug. 7, 1973, by the assignee, *Alpha Products, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,518,606.—*Robert A. Barker*, Port Huron, Mich. IGNITION CABLE WITH TERMINAL CONSTRUCTION. Patent dated June 30, 1970. Disclaimer and dedication filed Oct. 13, 1972, by the assignee, *Eltra Corporation.*

Hereby disclaims and dedicates said patent to the Public.

3,707,397.—*Donald W. Gagnon*, Sylvania, Ohio. PROCESS FOR PROVIDING UNIFORM ORGANOPOLYSILOXANE COATINGS ON POLYCARBONATE AND ACRYLIC SURFACES. Patent dated Dec. 26, 1972. Disclaimer and dedication filed, Oct. 9, 1973, by the assignee, *Owens-Illinois, Inc.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Disclaimers

3,213,303.—*Robert H. Riley, Jr.*, Towson, and *Melvin H. Neuhardt*, Baltimore, Md. CORDLESS DIRECT CURRENT MOTOR DEVICE UTILIZING PERMANENTLY-MAGNETIC TUBULAR SEGMENTS. Patent dated Oct. 19, 1965. Disclaimer filed Nov. 7, 1973, by the assignee, *The Black and Decker Manufacturing Company.*

Hereby enters this disclaimer to the said claim of said patent.

3,275,186.—*Martin Himmel*, Mount Vernon, N.Y. PERCOLATOR COFFEE POT AND TOP THEREOF. Patent dated Sept. 27, 1966. Disclaimer filed Nov. 12, 1973, by the assignee, *Tops Manufacturing Company, Inc.*

Hereby enters this disclaimer to claims 1, 2, and 10 of said patent.

3,563,990.—*Goetz E. Hardtmann*, Florham Park, N.J. 1-SUBSTITUTED-4-ARYL-2(1H)-QUINAZOLINONES. Patent dated Feb. 16, 1971. Disclaimer filed Sept. 21, 1973, by the assignee, *Sandoz-Wander, Inc.*

Hereby enters this disclaimer to all claims of said patent.

3,613,544.—*Hanns Plihal, Gerhard Rothy*, and *Josef Schild*, Vienna, Austria. OPTICAL SYSTEM. Patent dated Oct. 19, 1971. Disclaimer filed Oct. 1, 1973, by the assignees, *Karl Vockenhuber and Raimund Hauser.*

Hereby enter this disclaimer to claims 1, 2 and 3 of said patent.

3,678,672.—*Charles David Brissey* and *Marvin Nathaniel Trotter*, Anderson, S.C. QUILL OR BOBBIN SPINNING AND WINDING FRAME WITH SEMI-AUTOMATIC DOFFING AND DONNING. Patent dated July 25, 1972. Disclaimer filed Sept. 28, 1973, by the assignee, *J. P. Stevens & Co., Inc.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,691,928.—*Vernon R. Berg, Sr.* and *Vernon R. Berg, Jr.*, Marshfield, Wis. BARN VENTILATOR. Patent dated Sept. 19, 1972. Disclaimer filed Sept. 28, 1973, by the inventors.

Hereby enter this disclaimer to claims 1, 2 and 5 of said patent.

3,694,680.—*Anthony Jacyno*, Aurora, Ill. STAMPED SHELL SHEET METAL FRAME MODULE FOR A POWER TOOL. Patent dated Sept. 26, 1972. Disclaimer filed June 14, 1973, by the assignee, *McGraw-Edison Company.*

Hereby disclaims the portion of the term of the patent subsequent to Aug. 29, 1989.

3,711,839.—*Victor L. Sell*, Santa Monica, and *Syed M. S. Alvi*, Placentia, Calif. HIGH DENSITY CORE MEMORY MATRIX. Patent dated Jan. 16, 1973. Disclaimer filed Nov. 7, 1973, by the assignee, *Ampex Corporation.*

Hereby enters this disclaimer to claims 7, 8 and 18 of said patent.

3,715,072.—*Billy J. Miskopf* and *Ronald W. Wiemann*, Houston, Tex. MULTIPLE-CELL BOX FOR FLOWABLE MATERIAL. Patent dated Feb. 6, 1973. Disclaimer filed Oct. 19, 1973, by the assignee, *Crown Zellerbach Corporation.*

Hereby enters this disclaimer to claims 1 through 7 of said patent.

3,715,902.—*Francis Joseph Fuchs, Jr.*, Princeton Junction, N.J. METHOD AND APPARATUS FOR OPERATING ON A BLANK OF MATERIAL, E.G., DEEP DRAWING. Patent dated Feb. 13, 1973. Disclaimer filed Nov. 16, 1973, by the assignee, *Western Electric Company, Incorporated.*

Hereby enters this disclaimer to claims 1, 2, 3, 6, 7, 8, 37, 38, 39, 40, 41, 42, 60, 61, 62, 65, 66, 67, 96, 97, 98, 99, 100 and 101 of said patent.

3,738,480.—*Frank G. Chesley*, Red Wing, Minn. MEDICATION CONTAINER. Patent dated June 12, 1973. Disclaimer filed Nov. 9, 1973, by the inventor.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,740,141.—*John H. De Witt, Jr.*, Nashville, Tenn. TIMING AND MEASURING METHODS AND MEANS FOR LASER DISTANCE MEASUREMENTS. Patent dated June 19, 1973. Disclaimer filed Oct. 11, 1973, by the assignee, *Laser Systems & Electronics, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,779,980.—*Harman L. Liebman* and *Shirley A. Liebman*, Lancaster, and *Gary W. Paddison*, York, Pa. POLY (VINYL CHLORIDE) HOMOPOLYMER COMPOSITES FREEZE-DRY TECHNIQUE FOR PREPARATION. Patent dated Dec. 18, 1973. Disclaimer filed Dec. 19, 1973, by the assignee, *Armstrong Cork Company*.

Hereby enters this disclaimer to claims 1 to 6 of said patent.

Patents Available for Licensing or Sale

3,237,885. SPACE CRAFT. Jack L. Mohar, 41 W. Arbor St., Long Beach, Calif., 90805.

3,295,265. CIRCULAR MULTI-PURPOSE BUILDING AND ITS ASSEMBLING METHOD. Naoto Hida. Correspondence to: Watanabe Patent Law Office, Koenji Minami 1–29–16, Suginami, Tokyo 166, Japan.

3,319,272. CURLER PILLOW. Mrs. E. F. Eller, 100 98th NE., Apt. E–1, Bellevue, Wash., 98004.

3,474,799. TOOTH SPACE CLEANER USING DENTAL FLOSS LINKS ON HOLDER. Vito P. Cappello, 1047 Franklin St., Santa Monica, Calif., 90403.

3,718,906. VENDING SYSTEM FOR REMOTELY ACCESSIBLE STORED INFORMATION. Robert W. Lightner, P.O. Box 42, Cocoa Beach, Fla., 32931.

3,727,118. CONTACTLESS REVERSIBLE DEVICE IN AN ELECTRIC CAR. Nippon Gijutsu Boeki Co., Ltd., 32F Kasumigaseki Bldg., 2–5 Kasumigaseki, 3-chome, Chiyoda-ku, Tokyo 100, Japan.

3,729,092. UNWIND SUPPORT FOR COILED WIRE. William B. Marcell, 3950 NW. 36th Terrace, Fort Lauderdale, Fla., 33309.

3,745,651. PROCESS FOR ADJUSTING THE FIT OF AND REPAIRING DENTURES. Etablissement Rivolan, Liechtenstein, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,756,462. NUT BOWL. Harvey D. Cain, 641 Cambrian Court, Sacramento, Calif., 95825.

3,758,894. CHAIR BATH. Mary L. Finley, 11440 S. Morgan St., Chicago, Ill., 60643.

3,742,718. TUBE DRIVING APPARATUS. Bruno Weiss, Kolberger, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,767,091. DEVICE TO RUFFLE OR PLEAT MATERIAL. Sylvester A. and Jewelle M. Dalske, 110 Caselli Circle, #1, Sacramento, Calif., 95823.

3,762,393. HAND WARMER BATTERY HEATER. Louis R. O'Hare, 940–B 49th St., Los Alamos, N. Mex., 87544.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 67 patents.

Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of the Americas, New York, N.Y., 10036.

Re. 27,793. BLANKING CIRCUITS FOR TELEVISION RECEIVERS.

3,762,723. AUTOMATIC RECORD CHANGER.

3,762,968. METHOD OF FORMING REGION OF A DESIRED CONDUCTIVITY TYPE IN THE SURFACE OF A SEMICONDUCTOR BODY.

3,763,311. REDUCTION OF NON-LINEAR SPATIAL DISTORTION IN HOLOGRAPHIC SYSTEM EMPLOYING DIFFERENT WAVELENGTHS FOR RECORDING AND PLAYBACK.

3,763,315. BLANKING CIRCUITS FOR TELEVISION RECEIVERS.

3,763,352. SELF-CLEANING READ HEAD.

3,763,393. LINEARITY CORRECTION CIRCUIT FOR A CATHODE RAY TUBE.

3,763,395. INTERFERENCE SUPPRESSION CIRCUITS.

3,763,396. INTERFERENCE SUPPRESSION CIRCUITS.

3,763,480. DIGITAL AND ANALOG DATA HANDLING DEVICES.

3,763,560. CUTTING PLIERS.

3,764,740. CATHODE-RAY-TUBE-YOKE COMBINATION WITH AT LEAST TWO SPACED BODIES OF ORGANIC THERMOPLASTIC MATERIAL THEREBETWEEN AND A METHOD OF MAKING SAID COMBINATION.

3,764,865. SEMICONDUCTOR DEVICES HAVING CLOSELY SPACED CONTACTS.

3,764,903. PHASE MEASURING SYSTEM.

3,764,929. PUSH-PULL DARLINGTON AMPLIFIER WITH TURN-OFF COMPENSATION.

3,765,023. CIRCULARLY POLARIZED ANTENNA.

3,765,586. FILM HANDLING APPARATUS.

3,765,941. METHOD OF PREVENTING INOPERATION OF A COMPONENT BY LOOSE PARTICLES OF MATERIAL.

3,765,970. METHOD OF MAKING BEAM LEADS FOR SEMICONDUCTOR DEVICES.

3,766,313. CIRCUIT FOR TRANSMITTING DIGITAL SIGNALS TO CONVENTIONAL TELEVISION RECEIVER.

3,766,328. SLANT TRACK ROTATING HEAD RECORDER-REPRODUCER SYSTEM FOR SELECTIVE RETENTION OF SPECIAL INFORMATION.

3,766,393. OPTICAL DATA TRANSMISSION SYSTEM EMPLOYING POLARIZATION-SHIFT, MULTIPLE-CAVITY LASER.

3,766,419. CATHODE-RAY TUBE WITH SHADOW MASK HAVING RANDOM WEB DISTRIBUTION.

3,766,530. COMMUNICATIONS BETWEEN CENTRAL UNIT AND PERIPHERAL UNITS.

3,766,637. METHOD OF MAKING MOS TRANSISTORS.

3,767,285. ENHANCED READOUT OF STORED HOLOGRAMS.

3,767,408. DIRECT PRINT-UT PHOTOGRAPHIC OPTICAL RECORDING MEDIA COMPRISING A RHODAMINE DYE.

3,767,462. METHOD FOR FABRICATION OF POLYCRYSTALLINE FILMS.

3,767,481. METHOD FOR EPITAXIALLY GROWING LAYERS OF A SEMICONDUCTOR MATERIAL FROM THE LIQUID PHASE.

3,767,581. RADIATION RESISTANT LITHIUM FERRITE CORES.

3,767,845. COLOR IMAGE REPRODUCING APPARATUS.

3,767,853. AUTOMATIC IRIS CONTROL.

3,767,854. DELAY OF VIDEO AMPLIFIER D.C. BIAS CHANGE TO ACCOMMODATE RISE/FALL OF KINESCOPE HIGH VOLTAGE AFTER TURN ON/OFF OF RECEIVER.

3,767,906. MULTIFUNCTION FULL ADDER.

3,767,943. DIRECT-COUPLED TRIGGERED FLIP-FLOP.

3,767,960. HIGH VOLTAGE REGULATOR.

3,767,963. HIGH VOLTAGE HOLD DOWN CIRCUIT.

3,767,967. INSTANT-ON CIRCUITRY FOR AC/DC TELEVISION RECEIVERS.

3,768,029. TEMPERATURE COMPENSATION OF TRANSFERRED ELECTRON AMPLIFIERS.

3,768,040. WAVEGUIDE ASSEMBLY INCLUDING A TOROID HAVING DIELECTRIC MATERIAL THEREIN.

3,768,043. WIDEBAND HYBRID SYSTEM.

3,768,047. LATTICE NETWORK USING DISTRIBUTED IMPEDANCE TRANSMISSION LINES.

3,769,588. REMOTE CONTROL SYSTEM FOR A TELEVISION RECEIVER.

3,769,589. RATE AIDED RANGING AND TIME DISSEMINATION RECEIVER.

3,769,602. ANALOG PHASE TRACKER.

3,769,617. TRANSMISSION LINE USING A PAIR OF STAGGERED BROAD METAL STRIPS.

3,769,688. METHOD OF MAKING AN ELECTRICALLY-INSULATING DEAL BETWEEN A METAL BODY AND A SEMICONDUCTOR DEVICE.

3,769,908. METAL MASK SCREEN FOR SCREEN-PRINTING.

3,770,434. METHOD FOR MAKING AN IMAGE SCREEN STRUCTURE FOR AN APERTURED-MASK CATHODE-RAY TUBE USING A MASK HAVING TEMPORARY APERTURES.

3,770,944. ARTICLE IDENTIFICATION APPARATUS.

3,770,973. APPARATUS FOR REMOTELY MEASURING THE TEMPERATURE AND EMISSIVITY OF A RADIANT OBJECT INDEPENDENT OF THE OBJECT'S RADIANT SURFACE PROPERTY.

3,771,059. UNIVERSAL DATA QUALITY MONITOR.

3,771,483. APPARATUS AND METHOD FOR THE AUTOMATIC NAVIGATION OF A SAILING VESSEL.

3,771,919. BRAKING ARRANGEMENT WHICH INCLUDES HYDRAULIC PUMP.

3,772,554. IN-LINE ELECTRON GUN.

3,772,575. HIGH HEAT DISSIPATION SOLDER-REFLOW FLIP CHIP TRANSISTOR.

3,772,599. MICROWAVE DOUBLE BALANCED MIXER.

3,772,601. DUAL CHANNEL BALANCED LINE TYPE MODULATOR.

3,772,612. LIGHT MODULATOR.

3,772,613. BALANCED LINE TYPE PULSER CIRCUIT.

3,773,400. PROCESS FOR FIXING HOLOGRAPHIC PATTERNS IN ELECTRO-OPTIC CRYSTALS AND THE CRYSTALS PRODUCED THEREBY.

3,773,540. CATHODOCHROMIC IMAGE SCREEN AND METHOD FOR PREPARING CATHODOCHROMIC SODALITE FOR SAID IMAGE SCREEN.

3,774,116. ELECTRON BEAM ADDRESSABLE MEMORY SYSTEM.

3,774,158. MULTIPLE TERMINAL DISPLAY SYSTEM.

3,775,554. MODULATOR SYSTEM.

3,775,555. MODULATOR SYSTEM.

3,775,637. CATHODE RAY DISPLAY INTENSITY CONTROL CIRCUIT.

General Electric Company is prepared to grant non-exclusive licenses under the following 75 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent should be addressed to: Patent Counsel, Speed Variator Products Department, General Electric Company, 1501 Roanoke Blvd., Salem, Va., 24153.

3,207,974. INVERTER CIRCUITS.

Applications for licensing under the following patent may be addressed to: Patent Counsel, General Electric Company, Box 237 G.P.O., Detroit, Mich., 48232.

3,718,447. GRINDING WHEELS FORMED FROM PREPOLYMER COMPOSITIONS CONTAINING ALIPHATICALLY UNSATURATED IMIDO RADICALS.

Applications for license under the following patent should be addressed to: Division Patent Counsel, Space Division, General Electric Company, P.O. Box 8555, Philadelphia, Pa., 19101.

3,736,447. UNIFORM IONIZATION MEANS FOR MHD GENERATORS.

Applications for licensing under the following patent may be addressed to: General Electric Company, Appliance Components Business Division, 1635 Broadway, Fort Wayne, Ind., 46804. Attn: Patent Counsel.

3,757,927. BAR STOCK STORAGE DISPENSING AND FEEDING APPARATUS AND METHOD.

Applications for licenses under the following patent may be addressed to: Division Patent Counsel, Switchgear Equipment Business Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,761,599. MEANS FOR REDUCING EDDY CURRENT HEATING OF A TANK IN ELECTRIC APPARATUS.

Applications for licenses under the following 2 patents may be addressed to: General Electric Company, Construction Materials Division, 4755 Kingsway Drive, Suite 416, Indianapolis, Ind., 46205. Attn: Division Patent Counsel.

2,912,557. ELECTRIC COOKING APPLIANCE.

3,317,699. POWER SUPPLY FOR A MAGNETRON.

Applications for licenses under the following 5 patents may be addressed to: Patent Counsel, Drive Systems Product Department, General Electric Co., 1501 Roanoke Blvd., Salem, Va., 24153.

2,977,523. CONTROL CIRCUIT.

3,095,534. CIRCUIT FOR CONTROLLING ENERGIZATION OF A DIRECT CURRENT LOAD.

3,170,344. METHOD AND APPARATUS FOR CONTROLLING THE THICKNESS OF ROLLED STRIP MATERIAL.

3,343,063. VARIABLE FREQUENCY CONVERTER WITH VOLTS PER CYCLE PER SECOND REGULATION.

Re. 26,996. COMPUTER CONTROL SYSTEM FOR METALS ROLLING MILL.

Applications for licenses under the following 14 patents may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,350,899. HOUSEHOLD REFRIGERATOR.

3,397,553. ICEMAKER INCLUDING IMPROVED SWEEP MEANS.

3,398,553. ICE MAKER INCLUDING IMPROVED SWEEP MEANS.

3,600,602. CONTROL ARRANGEMENT FOR A WASHING MACHINE.

3,721,900. MICROWAVE DETECTION INSTRUMENT AND ANTENNA THEREFOR.

3,734,416. WASTE FOOD DISPOSER MOUNTING ASSEMBLY.

3,736,037. RACK LEVEL ADJUSTMENT APPARATUS IN AN APPLIANCE CABINET.

3,747,518. TRASH COMPACTOR HAVING MEANS FACILITATING TRASH REMOVAL THEREFROM.

3,759,471. QUICK-RELEASE SUPPORT MEMBER ATTACHMENT MEANS.

3,760,792. FLOW-THROUGH SHUTTER FOR OVEN DOOR WINDOW.

3,760,838. HOSE STORAGE SYSTEM FOR A WASHING APPLIANCE.

3,761,153. DISH-WASHING MACHINE RACK ADJUSTMENT ASSEMBLY.

3,766,700. DECORATIVE TRIM STRIP MOUNTING MEANS.

3,767,897. PLUG-IN SURFACE HEATING UNIT WITH A TERMINAL BLOCK MOUNTING.

Applications for licenses under the following 34 patents may be addressed to: General Electric Company, Division Patent Counsel, Housewares Business Division, 1285 Boston Ave., Bridgeport, Conn., 06602.

3,138,674. ELECTRICAL TIME SWITCH MECHANISM.

3,118,027. ELECTRICAL SWITCH INCLUDING VISCOUSLY DAMPED TIMING DEVICE.

3,101,586. TIMER MECHANISM WITH IMPROVED GEAR MESHING MEANS.

3,086,351. COMBINED SWITCH AND ALARM ACTUATING APPARATUS.

3,085,136. TIME SWITCH.

3,078,358. TIME SWITCH.

3,062,931. ALARM CONTROL MECHANISM.

3,059,414. MINIATURE ALARM CLOCK.

3,033,948. TIME SWITCH AND ALARM.

2,994,183. ALARM CONTROL MECHANISM.

2,981,808. INTERVAL TIMER.

2,951,919. TIME SWITCH.

2,946,182. ALARM CLOCK CONTROL MECHANISM.

2,921,149. SEVEN DAY TIME CONTROL SWITCH.

2,890,300. TIME CONTROL SWITCH.

2,792,510. MOTOR STRUCTURE.

2,786,972. COMMERCIAL POWER FREQUENCY CORDLESS SYNCHRONOUS CLOCK.

3,598,937. CLOCK TIMER SWITCH.

3,591,737. SWITCH MECHANISM FOR ELECTRIC MOTOR SPRING WOUND CLOCK.

3,559,396. VARIABLE LOUDNESS ALARM MECHANISM.

3,475,900. ALARM CONTROL MECHANISM.

3,344,598. ALARM CONTROL MECHANISM.

3,328,953. CLOCK ALARM SET INDICATOR.

3,328,952. ALARM CLOCK.

3,328,570. ILLUMINATED PANEL MEMBER.

3,308,617. REPEAT ALARM WITH CONDITION INDICATOR.

3,289,630. CLOCK DIAL HAND.

3,282,041. ALARM SET INDICATING MEANS.

3,281,548. INTERVAL TIMER.

3,280,547. ALARM CONTROL MECHANISM.

3,224,062. ATTACHMENT AND SPACING MEANS.

3,195,300. ALARM SET INDICATING MEANS.

3,175,352. BELL ALARM DAMPING DEVICE.

3,152,229. REPEAT MECHANISM FOR A CLOCK CONTROLLED SWITCH.

Applications for licenses under the following 15 patents may be addressed to: General Electric Company, Transformer and Distribution Equipment Business Division, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

D. 211,391. FLOODLIGHT.

3,128,443. REACTIVE TRANSFORMERS.

3,334,270. DISCHARGE LAMP CIRCUIT.

3,334,271. ELECTRICAL DEVICE WITH VOLTAGE LIMITING ARRANGEMENT.

3,317,796. COOLING ARRANGEMENT FOR ELECTRICAL APPARATUS.

3,350,554. FLOODLIGHT.

3,501,627. AIRPORT LIGHTING FIXTURE.

3,523,238. CURRENT SENSING DEVICE.

3,524,107. LOW VOLTAGE LIGHTNING ARRESTER SPARK GAP.

3,657,650. CURRENT AND VOLTAGE MONITORING MODULE FOR ELECTRIC CONDUCTOR TERMINATIONS.

3,723,819. LOW VOLTAGE SECONDARY LIGHTNING ARRESTER SPARKGAP ASSEMBLY.

3,731,295. LEAK DETECTOR FOR ENCLOSED ELECTRICAL APPARATUS.

3,735,088. BRAZING METHOD AND APPARATUS.

3,737,712. SPARKGAP ASSEMBLY HAVING A SEMI-CONDUCTIVE COATING ADJACENT THE ELECTRODES THEREOF.

3,762,939. METHOD OF PROTECTING A METALLIC SURFACE FROM CORROSION AND RESULTANT ARTICLE.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA Patent Licensing Regulations.

Copies of patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the patent application number and the title. Requests for licensing information should be directed to the address cited with each copy of the patent application.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at $0.50 each. Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20014

Patent application 357,272. Measurement of Carbon Dioxide. Filed May 4, 1973. PC $3/MF $1.45.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW., Washington, D.C. 20240

Patent application 401,004. Smelting of Nickel Oxide Ores To Produce Ferronickel. Filed Sept. 28, 1973. PC $3/MF $1.45.

Patent application 402,560. Constrained Layer Damper and Noise Suppressor for a Rock Drill Steel. Filed Oct. 1, 1973. PC $3/MF $1.45.

Patent 3,632,479. Treatment of Coal To Prevent Agglomeration. Filed Aug. 25, 1969. Patented Jan. 4, 1972. Not available NTIS.

Patent 3,634,070. Process for Recovery of Copper and Other Metals From Source Materials. Filed July 29, 1969. Patented Jan. 11, 1972. Not available NTIS.

Patent 3,653,875. Recovery of Metals and Phosphate From Waste Phosphate Sludge. Filed Mar. 2, 1971. Patented Apr. 4, 1972. Not available NTIS.

Patent 3,669,954. Process for Producing Semipermeable Membranes. Filed May 4, 1970. Patented June 13, 1972. Not available NTIS.

Patent 3,663,719. System for Cooking Fish. Filed Dec. 3, 1969. Patented May 16, 1972. Not available NTIS.

DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

Patent 3,680,104. Phase Reversal Pulse Modulator and Pulse Compression Filter for a Coherent Radar. Filed July 22, 1970. Patented July 25, 1972. Not available NTIS.

Patent 3,680,136. Current Sheet Antenna. Filed Oct. 20, 1971. Patented July 25, 1972. Not available NTIS.

Patent 3,680,137. Circular Symmetric Bootlace Lens System. Filed Dec. 3, 1970. Patented July 25, 1972. Not available NTIS.

Patent 3,680,196. Process for Bonding Chip Devices to Hybrid Circuitry. Filed May 8, 1970. Patented Aug. 1, 1972. Not available NTIS.

Patent 3,689,848. Voltage-to-Current Converter. Filed May 4, 1970. Patented Sept. 5, 1972. Not available NTIS.

Patent 3,690,463. Floating Suction Head. Filed July 13, 1971. Patented Sept. 12, 1972. Not available NTIS.

Patent 3,690,915. Method of Forming Gallium Phosphide Coatings. Filed Dec. 16, 1969. Patented Sept. 12, 1972. Not available NTIS.

Patent 3,691,515. Variable Reluctance Magnetic Field Transducer. Filed Sept. 29, 1960. Patented Sept. 12, 1972. Not available NTIS.

Patent 3,693,038. Traveling Wave Tube (TWT) Oscillation Prevention Device. Filed May 3, 1971. Patented Sept. 19, 1972. Not available NTIS.

Patent 3,693,072. Ferromagnetic Resonance Magnetometer. Filed Aug. 25, 1967. Patented Sept. 19, 1972. Not available NTIS.

Patent 3,694,029. Aircraft Seat Restraint Tensioning Mechanism. Filed Sept. 22, 1971. Patented Sept. 26, 1972. Not available NTIS.

Patent 3,695,058. Flexible Link Rotatable Drive Coupling. Filed May 26, 1971. Patented Oct. 3, 1972. Not available NTIS.

Patent 3,696,066. Plasticized Compositions. Filed Jan. 8, 1971. Patented Oct. 3, 1972. Not available NTIS.

Patent 3,696,325. Complaint Suspension Cable. Filed May 14, 1970. Patented Oct. 3, 1972. Not available NTIS.

Patent 3,696,495. Threaded Ring Turning Device. Filed Apr. 5, 1971. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,696,599. Cable Fairing System. Filed July 16, 1971. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,696,621. Method of Soil Stabilization. Filed Aug. 10, 1970. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,696,846. Tool for U-Bending of Plated Wire. Filed June 15, 1971. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,696,894. Acceleration Sensitive Shock Absorber Valve. Filed July 2, 1971. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,697,154. Optical Viewing System. Filed May 12, 1971. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,697,422. Intumescent Fillers for Paints. Filed Nov. 23, 1970. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,697,425. Bearings Comprising Polyolefins and an Imine Modified Carbon Black Compound. Filed Jan. 14, 1971. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,697,434. Chemiluminescent Spray Formulation. Filed Oct. 5, 1965. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,697,476. Polyolefins Containing an Imine Modified Carbon Black Compound. Filed Jan. 14, 1971. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,697,831. Series Electrical, Parallel Thermal Gunn Devices. Filed Dec. 28, 1970. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,697,856. Voltage Regulating Circuit. Filed Dec. 14, 1970. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,697,886. Solid State Radio Frequency Voltage Controlled Oscillator, Power Amplifier and Direct Current Power Supply. Filed Nov. 8, 1971. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,697,890. Wide Deviation Voltage Controlled Crystal Oscillator With Temperature Compensation. Filed June 9, 1969. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,697,969. Magnetic Tape With Plural Clocks. Filed Nov. 29, 1971. Patented Oct. 10, 1972. Not available NTIS.

Patent 3,698,098. Method for Drying Articles Having a Low Heat Tolerance. Filed Mar. 29, 1971. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,698,420. Drain Valve Having Auxiliary Seal. Filed Dec. 5, 1968. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,698,591. Pressure Chamber Closure. Filed Jan. 4, 1971. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,698,960. Solid Battery Electrolyte and Method of Preparation Thereof. Filed June 21, 1971. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,699,423. D.C. to A.C. Converter With Unique Feedback Demodulation. Filed Dec. 29, 1971. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,699,763. 24-Hour Digital Clock. Filed July 6, 1971. Patented Oct. 24, 1972. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 263,230. Amplitude Steered Antenna Array. Filed June 15, 1972. PC $3/MF $1.45.

Patent application 340,862. Electro-Mechanical Sine/Cosine Generator. Filed Mar. 13, 1973. PC $3/MF $1.45.

Patent application 370,999. Transmitting and Reflecting Diffuser. Filed June 18, 1973. PC $3/MF $1.45.

Patent application 393,526. Condensate Removal Device for Heat Exchange. Filed Aug. 31, 1973. PC $3.25/MF $1.45.

Patent application 393,527. Remote Platform Power Conserving System. Filed Aug. 31, 1973. PC $3/MF $1.45.

Patent application 394,206. Radiation Hardening of MOS Devices by Boron. Filed Sept. 4, 1973. PC $3/MF $1.45.

Patent application 395,493. Totally Confined Explosive Welding. Filed Sept. 10, 1973. PC $3/MF $1.45.

Patent application 395,868. Dish Antenna Having Switchable Beam Width. Filed Sept. 10, 1973. PC $3.25/MF $1.45.

Patent application 397,477. Alphanumeric Character Generator for Oscilloscopes. Filed Sept. 14, 1973. PC $3.25/MF $1.45.

Patent application 398,901. Hole Cutter. Filed Sept. 19, 1973. PC $3/MF $1.45.

Patent application 402,867. Meteoroid Impact Position Locator Aid for Manned Space Vehicles. Filed Oct. 2, 1973. PC $3/MF $1.45.

Patent application 403,695. All Sky Pointing Attitude Control System. Filed Oct. 4, 1973. PC $3.75/MF $1.45.

Patent application 402,868. Vacuum Leak Detector. Filed Oct. 2, 1973. PC $3/MF $1.45.

Patent 3,748,722. Production of Hollow Components for Rolling Element Bearings by Diffusion Welding. Patented July 31, 1973. Not available NTIS.

Patent 3,375,885. Burrowing Apparatus. Patented Apr. 2, 1968. Not available NTIS.

Patent 3,749,332. Space Vehicle With Artificial Gravity and Earth-Like Environment. Patented July 31, 1973. Not available NTIS.

Patent 3,752,665. Synthesis of Superconducting Compounds by Explosive Compaction of Powders. Patented Aug. 14, 1973. Not available NTIS.

Patent 3,753,148. Infrared Tunable Laser. Patented Aug. 14, 1973. Not available NTIS.

Patent 3,754,236. Digital to Analog Conversion Apparatus. Patented Aug. 21, 1973. Not available NTIS.

Patent 3,754,263. Lightning Tracking System. Patented Aug. 21, 1973. Not available NTIS.

Patent 3,755,265. Highly Fluorinated Polyurethanes. Patented Aug. 28, 1973. Not available NTIS.

Patent 3,755,686. Powerplexer. Patented Aug. 28, 1973. Not available NTIS.

Patent 3,757,183. Redundant Speed Control for Brushless Hall Effect Motor. Patented Sept. 4, 1973. Not available NTIS.

Patent 3,757,476. Expandable Space Frames. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,757,568. Compression Test Assembly. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,757,659. Exposure Interlock for Oscilloscope Cameras. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,758,718. Transparent Switchboard. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,758,741. Enhanced Diffusion Welding. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,758,781. Radiation and Particle Detector and Amplifier. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,759,152. Automatic Lightning Detection and Photographic System. Patented Sept. 18, 1972. Not available NTIS.

Patent 3,759,588. High Speed Hybrid Bearing Comprising a Fluid Bearing and a Rolling Bearing Convected in Series. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,759,672. Star Tracking Reticles. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,760,239. Coaxial Inverted Geometry Transistor Having Buried Emitter. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,760,257. Electromagnetic Wave Energy Converter. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,760,394. Event Sequence Detector. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,762,884. Nickel Aluminide Coated Low Alloy Stainless Steel. Patented Oct. 2, 1973. Not available NTIS.

Patent 3,762,918. Cobalt-Base Alloy. Patented Oct. 2, 1973. Not available NTIS.

Patent 3,763,204. Polymerizable Disilanols Having In-Chain Perfluoroalkyl Groups. Patented Oct. 2, 1973. Not available NTIS.

Patent 3,763,691. Meteoroid Detector. Patented Oct. 9, 1973. Not available NTIS.

Patent 3,763,928. Electrostatically Controlled Heat Shutter. Patented Oct. 9, 1973. Not available NTIS.

Patent 3,764,209. Hand-Held Photomicroscope. Patented Oct. 9, 1973. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St. SW., Washington, D.C. 20590

Patent application 396,769. Statistical Sound Level Analyzer. Filed Sept. 13, 1973. PC $3/MF $1.45.

[FR Doc. 74–1231; Filed 1–15–74; 8:45 am]

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 19, 1974

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-02-73
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-25-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-11-72
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-04-73
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-01-72
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	6-13-73
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	9-18-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-02-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-16-72
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-02-73
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	4-11-72
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-16-73
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-26-73
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-02-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-22-73
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-28-72

Expiration of patents: The patents within the range of numbers indicated below expire during January 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,775,762 to 2,779,941, inclusive
Plant Patents..... Numbers 1,543 to 1,558, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED FEBRUARY 5, 1974

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T919,001
MIXED ACETALS AND PROCESS FOR THEIR PREPARATION

Lucien Person, Chicago, Ill.
(136 Boulevard Jean Jaures, 92-Clichy, France)

Continuation of abandoned application Ser. No. 876,022, No. 12, 1969. This application Dec. 29, 1972, Ser. No. 319,325

Int. Cl. C07c *43/20*
U.S. Cl. 260—615 B
No Drawing. 16 Pages Specification

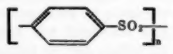
Mixed acetals of low molecular weight alcohols and compounds containing one or more hydroxyl groups are prepared by reacting an alpha-halo dialkyl ether, a compound containing at least one hydroxy group and an alkylene oxide in a temperature range of about 20° C. to 150° C. The mixed acetals are useful as surfactants and are characterized by excellent stability in alkaline media.

T919,002
AROMATIC POLYSULPHONES PRODUCED BY OXIDATION OF AROMATIC POLYMERS

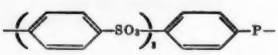
John Brewster Rose, Letchworth, and Ian Charles Taylor, Hertford, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 19, 1973, Ser. No. 324,968
Claims priority, application Great Britain, Feb. 7, 1972, 5,488/72, 5,489/72
Int. Cl. C08g *23/00*
U.S. Cl. 260—49
No Drawing. 26 Pages Specification

Aromatic block copolymers are provided whose molecular chains comprise blocks having the formula



where *n* is an integer having the value 2 or greater the blocks being linked by units and/or a plurality of units having the formula —Ar—Q— and optionally also —Ar—, in which Ar is a phenylene radical, preferably 1,4-phenylene and Q is —O—, —CO—, —CR_1R_2—, where R_1 and R_2 may be the same or different and represent hydrogen, lower alkyl, lower aryl and halogen substituted groups thereof. A preferred block copolymer comprises a chain which comprises blocks having the formula



where P is selected from —O—, —CO— and

$$—C(CH_3)_2—$$

These block copolymers may be formed by reacting the corresponding aromatic polysulphide with an oxidizing agent such as hydrogen peroxide in glacial acetic acid. A preferred method for making these block copolymers which have at least one unit having the formula

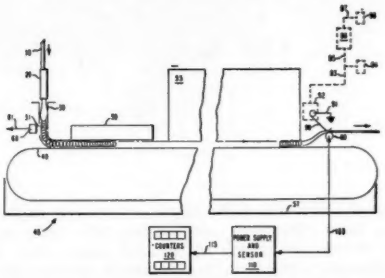
—Ar—O—

comprises reacting an alkali metal salt of at least one halophenol with a substantially equimolar mixture of at least one dihalobenzoid compound and a dialkali metal salt of at least one bisthiophenol in which the halogen atoms of the halophenol and dihalobenzenoid compound are activated by at least one electron-attracting group to form an aromatic polysulphide and then reacting the aromatic polysulphide with an oxidizing agent.

T919,003
AUTOMATIC CONTROL FOR TOW DRYERS

Frank Melvin Heckendorn II, 118 Leonards Circle, Camden, S.C. 29020

Filed May 18, 1973, Ser. No. 361,409
Int. Cl. F26b *13/00*
U.S. Cl. 34—55
3 Sheets Drawing. 4 Pages Specification



An apparatus combining void detection at the entrance and moisture detection at the exit of a tow dryer. The void detector comprises a pneumatic sensor and associated pressure switch and relay elements to provide readout and to stop the dryer motor drive upon detection of a void. Moisture is monitored by a continuous electrical conductivity measuring apparatus comprising a grounded feeler riding above and against the tow and a conducting guide below the tow which is attached to electrical circuitry arranged not only to count and alarm when moisture in the tow exceeds certain predetermined limits but also to provide a measure of length of such moisture spots in the tow. The grounded feeler also serves as a part of a detector of tow mechanical defects by being mounted to the input shaft of a pneumatic position transmitter which in turn is arranged to stop the tow moving means when actuated by movement of the feeler as a knot or similar defects passes under the feeler.

T919,004
PROCESS FOR PREPARING A FLAME RESISTANT, HEAT TRANSFER PRINTED FABRIC

Gary L. Bond, 1352 Warpath Drive, Apt. 1, Kingsport, Tenn. 37664

Filed July 16, 1973, Ser. No. 379,874
Int. Cl. B41m *5/18*
U.S. Cl. 117—36.2
No Drawing. 7 Pages Specification

Disclosed is a process for preparing a flame resistant, heat transfer printed fabric. According to this process a

heat transfer printing paper is prepared by applying a sublimable disperse dye to selected locations of the paper and uniformly applying to the paper a sublimable organic bromine compound of at least 6 carbon atoms containing, based on the weight of the organic bromine compound, from about 40 to about 85 weight percent bromine. A polyester fabric and the heat transfer printing paper are then brought into juxtaposition and the fabric, organic bromine compound and disperse dye are heated in a temperature range of about 200–215° C. In a preferred embodiment of this process the organic bromine compound is a phosphorus-containing aliphatic bromine compound. In a still more preferred embodiment of this process the organic bromine compound is tris(2,3-dibromopropyl phosphate) and the fabric is 100% poly(ethylene terephthalate).

REISSUES

FEBRUARY 5, 1974

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,909
FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

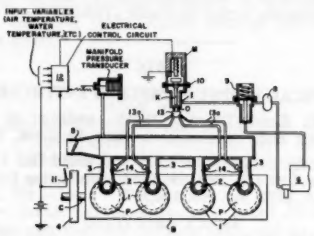
Robert Huber, Zumikon, Switzerland, assignor to Societe des Procedes Modernes d'Injection Sopromi, Les Mureaux, Yvelines, France

Original No. 3,460,520, dated Aug. 12, 1969, Ser. No. 629,190, Apr. 7, 1967. Application for reissue July 6, 1971, Ser. No. 159,970

Claims priority, application Switzerland, Apr. 14, 1966, 5,374/66

Int. Cl. F02m *51/00*

U.S. Cl. 123—32 EA **10 Claims**



A single fuel metering valve is provided to control the injection of fuel into a plurality of cylinders in an internal-combustion engine. A plurality of fuel injection nozzles are each coupled between the outlet of the fuel metering valve and the air intake conduit of a corresponding cylinder. An electrical control circuit is coupled between the crankshaft of the motor and the fuel metering valve to control the timing and the quantity of fuel injected into the air intake conduits through the fuel injection nozzles. The fuel injection nozzles can be electromagnetically actuated valves which are opened in sequence during the intake stroke of the corresponding cylinders. A fuel distributor can also be connected between the fuel metering valve and the injection nozzles to couple the fuel injection nozzles to the outlet of the fuel metering valve in time sequence.

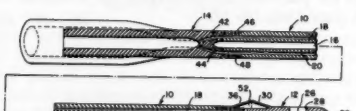
27,910
CATHETER

William C. Birtwell, North Scituate, R.I., assignor to Biomedical Engineering Associates, Inc., Boston, Mass.

Original No. 3,547,126, dated Dec. 15, 1970, Ser. No. 705,667, Feb. 15, 1968. Application for reissue July 29, 1971, Ser. No. 167,535

Int. Cl. A61m *25/00*

U.S. Cl. 128—349 B **8 Claims**



A Foley-type balloon catheter having an extruded body made of silicone rubber with a single drainage lumen and a plurality of inflation lumens, and a molded tip of silicone rubber attached to the body and having a drainage eye communicating with the drainage lumen, and a molded funnel attached to the other end of the body and having passages which communicate with drainage and inflation lumens.

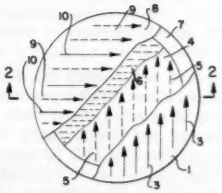
27,911
MEANS FOR ROTATING THE POLARIZATION PLANE OF LIGHT AND FOR CONVERTING POLARIZED LIGHT TO NON-POLARIZED LIGHT

John F. Dreyer, Cincinnati, Ohio, assignor to Polacoat Incorporated, Cincinnati, Ohio

Original No. 3,592,526, dated July 13, 1971, Ser. No. 841,857, July 15, 1969. Application for reissue Nov. 1, 1971, Ser. No. 194,610

Int. Cl. G02b *5/30*

U.S. Cl. 350—159 **11 Claims**



A light transmissive device which will rotate the plane of polarized light and will also de-polarize plane polarized light passed through the device, said device comprising a pair of directionally oriented supporting surfaces, such as unidirectionally rubbed glass or plastic plates, rotatable relative to each other and separated by a thin film of a non-optically active nematic liquid crystal material, the device acting to rotate the plane of the polarized light when the directionally oriented surface first contacted by the entering light is either parallel or perpendicular to the plane of polarization of the entering light and the remaining directionally oriented surface is rotated so as to bring its oriented surface to the desired plane of polarization for the exiting light, the device also acting to convert plane polarized light to non-polarized light when the oriented surface first contacted by the entering light lies at an angle of 45° with respect to the plane of polarization of the entering light and the directionally oriented surfaces are parallel to each other.

27,912
SCUM-RETARDANT CARRIER PARTICLES AND COMPOSITIONS THEREOF

Howard A. Miller, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original No. 3,547,822, dated Dec. 15, 1970, Ser. No. 702,201, Feb. 1, 1968. Application for reissue Dec. 23, 1971, Ser. No. 211,629

Int. Cl. G03g *9/02*

U.S. Cl. 252—62.1 **10 Claims**

Magnetically responsive carrier particles for use in magnetic-brush development of electrostatic images, comprising a core of ferromagnetic material overcoated with a thin, continuous layer of a film-forming, alkali-soluble

carboxylated polymer. The particles have a reduced tendency to cause scum formation on the surface of a photoconductive element.

27,913

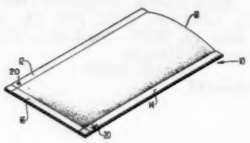
EASY OPEN POUCH CONSTRUCTION

James L. Hutcheson, Mechanicsville, Va., assignor to Reynolds Metals Company, Richmond, Va.

Original No. 3,650,461, dated Mar. 21, 1972, Ser. No. 11,459, Feb. 16, 1970. Application for reissue June 23, 1972, Ser. No. 265,737

Int. Cl. B65d *5/54, 31/02*

U.S. Cl. 229—66 **3 Claims**



An easy open pouch construction and a method of and apparatus for making same. Flexible packaging material is formed into a strip of pouches joined along their longitudinal side seams and fed intermittently through guide means adjacent a reciprocable hole puncher. The feeding means includes means such as an electric eye assembly for detecting the mid-point of the longitudinal side seam between adjacent pouches whereby the reciprocable hole puncher is actuated to punch a hole spaced a slight distance from the mid-point of the longitudinal seam. The strip of pouches is then cut to form an individual pouch which is filled conventionally. The resultant pouch is found to have improved easy opening characteristics.

27,914

SCISSORS-TYPE LINKAGE

John Calaby King, North Balwyn, Victoria, Australia, assignor to Concrete Formwork Engineers Pty., Ltd., Northcote, Victoria, Australia

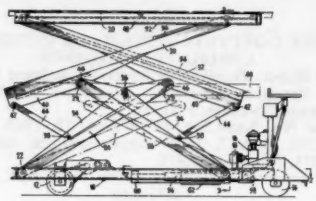
Original No. 3,700,070, dated Oct. 24, 1972, Ser. No. 164,756, July 21, 1971. Application for reissue Nov. 21, 1972, Ser. No. 308,336

Claims priority, application Australia, July 21, 1970, 1,921/70

Int. Cl. E04g *1/22*

U.S. Cl. 182—16 **7 Claims**

The invention relates to a scissors-type linkage mechanism for raising and lowering working platforms. The invention overcomes the prior art disadvantage of high initial raising force by providing a mechanism in which, in the fully collapsed position, the pivot point between the



two lowest links is substantially above the line of action of a horizontally acting hydraulic cylinder.

27,915

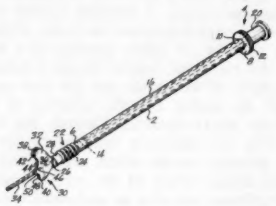
CERVICAL BIOPSY-SAMPLING INSTRUMENT

Gerald C. Kohl, Tacoma, Wash., assignor to Medics Research and Development, Inc., Spokane, Wash.

No Drawing. Original No. 3,554,185, dated Jan. 12, 1974, Ser. No. 709,470, Feb. 29, 1968. Application for reissue Nov. 29, 1972, Ser. No. 310,387

Int. Cl. A61b *10/00*

US. Cl. 128—2 B **7 Claims**



A cervical biopsy-sampling instrument is disclosed which comprises an aspirator having a spatulated sampling tip thereon by which a mucus aspirate and surface scrapings are collected from the cervix for cytological diagnosis. The tip is flexibly connected with the aspirator so that it can follow the relative deflection of the cervical canal when the canal is out of alignment with the vaginal canal. In addition, the scraping edge of the tip is defined on at least one side by a profile face of the tip which is substantially flat over the entire profile on that side, so that edge and face of the tip can be applied to a smear plate in the manner of a spatula for purposes of transferring the scrapings directly to the plate from the tip.

PLANT PATENTS

GRANTED FEBRUARY 5, 1974

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,463
CHRYSANTHEMUM PLANT
Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, Chicago, Ill.
Filed May 30, 1972, Ser. No. 258,004
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—79 **1 Claim**

A new variety of *Chrysanthemum morifolium* of standard incurved type for greenhouse culture having a nine-week response and producing very large, long lasting, golden apricot-bronze flower heads. This plant is a sturdy and vigorous grower with abundant foliage and is most suited for spring and fall flowering in northern states and for flowering from October through March in the southern states.

3,464
ROSE PLANT
Roy L. Byrum, Richmond, Ind., assignor to Joseph H. Hill Company, Richmond, Ind.
Filed May 24, 1972, Ser. No. 256,621
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—18 **1 Claim**

A new variety of greenhouse rose plant distinguished by its free and vigorous growing habit and its excellent production of medium large pink flowers having outer petals with delicate ruffled edges which give the flowers the "Old Lace" effect.

3,465
AZALEA PLANT
Anthony M. Shammarello, 4590 Monticello Blvd., Cleveland, Ohio 44143
Filed Dec. 17, 1971, Ser. No. 209,481
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—57 **1 Claim**

1. A new and distinct variety of azalea plant of the hardy evergreen type, substantially as herein shown and described, characterized particularly as to novelty by the radiant dark red color of its flowers resembling Wards Ruby, by the absence of fading of the flowers when exposed to the sun, by the hardiness of the plant and buds at low temperatures equal to the parent Hino-Red, by flowers slightly larger than the parent plant Hino-Red, and retaining the good qualities of the plant character of Hino-Red.

3,466
ROSE PLANT
Roy L. Byrum, Richmond, Ind., assignor to Joseph H. Hill Company, Richmond, Ind.
Filed May 24, 1972, Ser. No. 256,620
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—26 **1 Claim**

A new variety of pink floribunda rose for greenhouse culture distinguished by its free propagating ability, its vigorous growth habit, and its continuous and abundant production of medium sized blooms having a very attractive Dawn Pink to French Rose coloring.

3,467
ALMOND TREE
Alfonzo Ramos Carrion, Rte. 1, Box 32, Arbuckle, Calif. 95912
Filed Jan. 26, 1972, Ser. No. 202,709
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of almond tree characterized by good disease resistance and a well-sealed nut of good quality and flavor comparable to the Mission variety.

3,468
ROSE PLANT
Roy L. Byrum, Richmond, Ind., assignor to Joseph H. Hill Company, Richmond, Ind.
Filed July 26, 1972, Ser. No. 275,361
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—26 **1 Claim**

A new variety of greenhouse rose plant distinguished by its free and vigorous growing habit, consistency of propagation, abundant production, profuse lush green foliage and flowers of a lighter, more iridescent pink which have excellent keeping qualities.

3,469
BEGONIA PLANT
Dieter Hayler, Endersbach, Germany, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Aug. 22, 1972, Ser. No. 282,695
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A novel and distinctive elatior begonia cultivar which is a mutation of the cultivar Schwabenland, the new cultivar being characterized particularly by its salmon red colored, ruffled camellia type flowers having unusually heavy textured bracts and carried on strong, thick pedicels originating from an unusually heavy peduncle; foliage which has an overall wavy or undulating surface, and raspy edges, with the foliage being considerably thicker than average begonia foliage, and quite resistant to powdery mildew; by its tight compact growth associated with close internodes, heavy thick stems, and heavy thick leaf petioles; by its vigorous growth habit, and by its ability to be produced year around under controlled environmental conditions.

3,470
IVY PLANT
Mary Helen Poirier, 1701 Rosalind St., Sacramento, Calif. 95838
Filed May 17, 1972, Ser. No. 254,318
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—67 **1 Claim**

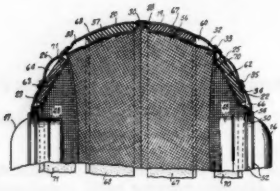
A mutation of *Hedera canariensis variegato* (Algerian variegated ivy) is distinctly characterized as a new variety by leaves which are all white (Plate 18–D–1 of Maerz and Paul Dictionary of Color). The new variety has been successfully asexually reproduced from cuttings as well as by ground-layering.

PATENTS

GRANTED FEBRUARY 5, 1974

GENERAL AND MECHANICAL

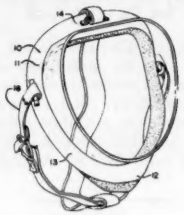
3,789,427
HEADGEAR STRUCTURE
Jackson Anthony Aileo, 200 Park St., Carbondale, Pa.
Division of Ser. No. 88,823, Nov. 12, 1970. This application Mar. 20, 1972, Ser. No. 236,524
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 R **24 Claims**



A flexible helmet having plural inner and outer panels of woven fabric cut and assembled so as to conform closely to heads of different shapes and sizes, and plural pads for protecting the wearer's head against impacts, the pads being removably carried in separate pockets formed by the inner and outer panels. The pads may be fabricated of resilient energy-absorbing material and/or may include a layer of flexible ballistic material for protection against blows from sharp objects. The helmet panels may be made of open mesh fabric, and the pads may be perforated for ventilation of the helmet; also, the inner surfaces of the pads may be so shaped or lined as to provide ventilation spaces between the pads and the wearer's head. Sound-attenuating earcups are carried by the helmet in position for close-fitting engagement with the head. Size adjustment of the helmet is effected by means of a variable length nape strap at the rear of the helmet. In addition, the helmet may carry communications equipment, including earphones within the earcups, and a microphone, with a switch for the microphone sealed in a watertight enclosure within one of the earcups. An elongated flap extending across the lower inner margin of the rear of the helmet may be folded over and fastened to provide a passage for holding the wiring of the communications equipment. For further protection of the head, a rigid outer shell may be placed over and detachably secured to the flexible helmet, being stabilized in position relative thereto by means of cooperating, complementary pressure-actuable surface contact fastening elements respectively carried on the crown portions of the outer surface of the flexible helmet and the inner surface of the rigid shell.

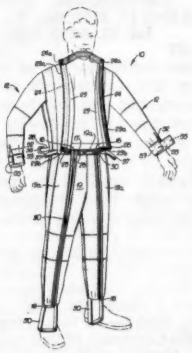
3,789,428
FACE PROTECTOR
William H. Martin, 124 Wildwood, Winnipeg, Manitoba, Canada
Filed Oct. 29, 1971, Ser. No. 193,638
Int. Cl. A42b *1/06*
U.S. Cl. 2—9 **4 Claims**

An open ended portion or buffer component is fitted to a flange having a flexible gasket engaging the face and a strap holds the protector onto the head of the wearer. The gasket can be positioned on the flange to suit the wearer. The open end portion protects the face and eyes by means of a buffer action thus preventing wind from striking the face and eyes. A



detachable tinted strip can be used and also a detachable fine screen cover if desired.

3,789,429
JUMP SUIT WITH ADJUSTABLE TRUNK
Joe N. Garcia, Wildomar, Calif., assignor to Marshall Yoakum, Los Angeles, Calif.
Filed Apr. 20, 1972, Ser. No. 245,774
Int. Cl. A41d *13/02* •
U.S. Cl. 2—79 **5 Claims**



A parachutist's jump suit comprises, in combination,

a. a trunk and arm and leg sleeves,

b. the trunk having a vertical split at the front thereof between the neck and waist, and having a horizontal split at the waist front,

c. structure to releasably fasten the trunk along said splits, and

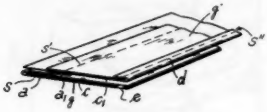
d. means accessible at the sides of the trunk to enlarge and diminish the encircling dimension of the trunk proximate the waist thereof.

3,789,430

PREFABRICATED TROUSER FLY

Christian Bernard, Mouvaux (Nord), France, assignor to Dolfus-Mieg & Cie, Paris, France

Filed June 22, 1971, Ser. No. 155,426
Claims priority, application France, Sept. 18, 1970, 70.33877
Int. Cl. A41d 1/06, 27/00
U.S. Cl. 2—234 7 Claims



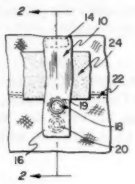
Improved fly for trousers of all types, obtained by prefabrication during a stage preceding the actual trouser making stage, the closing system of this fly being attached to at least one support consisting of any suitable material differing from the trouser material and having the form of a tape which, during the actual garment-making process, is secured for example by stitching to the trousers.

3,789,431

CLOTHING HAVING ADJUSTABLE BELT LOOPS

Robert B. Rand, P.O. Box 1939, Daytona Beach, Fla.

Filed Aug. 2, 1972, Ser. No. 277,267
Int. Cl. A41f 9/00
U.S. Cl. 2—236 10 Claims



Belt loops for an article of clothing normally worn with a belt which are adjustable to accommodate different width belts. Each loop comprises a length of loop material secured to the underlying main body surrounding portion of the garment at a first and second point of attachment along the length of the loop with at least one point of attachment being achieved by the use of disengageable fastening members which permit the space between the attached points to be enlarged or reduced as required.

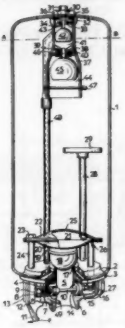
3,789,432

FLUSHING SYSTEM

Jean-Pierre Pozzi, Meudon, France, assignor to LaTrombe, Paris, France

Filed Apr. 17, 1972, Ser. No. 244,631
Claims priority, application France, Apr. 19, 1971, 71.13689
Int. Cl. E03d 3/00
U.S. Cl. 4—26 12 Claims

Flushing apparatus is provided comprising a cistern mounted between the feed-pipe and the flush-pipe and containing a device with an entry and air escape valve as well as a valve connected with a seating formed at the entry to the flush-pipe and subject to the hydrostatic pressure of the water contained in a chamber communicating with the said pipe through a valve governed by the handle operating the flush, wherein the valve (connected with the seating formed at the



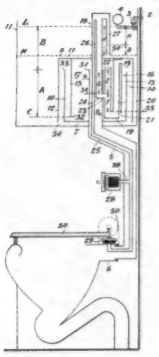
entry to the flush-pipe) is suspended from a flexible diaphragm forming one of the walls of said chamber communicating with the cistern through a small aperture provided in another section of the wall.

3,789,433

SIPHON WITH PNEUMATIC PRIMING AND SUCTION

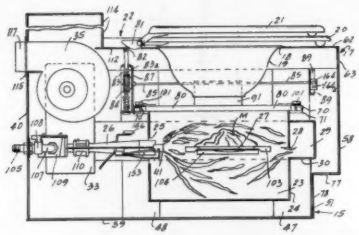
Angelo Brugnoli, Sidney, New South Wales, Australia, assignor to Francesco Amici and Maria Brugnoli, both of Rome, Italy

Filed Mar. 22, 1972, Ser. No. 236,891
Claims priority, application Italy, Apr. 6, 1971, 49565 A/71
Int. Cl. E03d 1/04, 5/04
U.S. Cl. 4—44 6 Claims



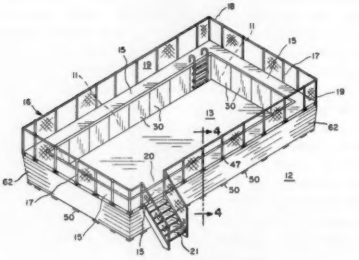
A siphon device for water closet tanks which includes a double bell siphon submerged in the liquid to be discharged, a liquid discharge pipe extending from the siphon to the closet bowl, a gas delivery and suction pipe, and a priming device which, in the inactive state, retains in the siphon, by means of a liquid column, a compressed air cushion, said compressed air cushion being formed during the submersion of the siphon. A pneumatic pump, connected with the priming device, sucks the liquid in said device and lets the compressed air cushion, which, in the state of rest, prevents the siphon from being primed, freely discharge into the siphon.

3,789,434
INCINERATOR TOILET
Walter J. Vollrath, Jr.; Richard J. Vollrath, both of Sheboygan; Paul R. Virnoche, Newton; Joseph Turk, Sheboygan; Paul E. Gerdes, Sheboygan, and Roy W. Singer, Sheboygan, all of Wis., assignors to Polar Ware Company, Sheboygan, Wis.
Filed Aug. 3, 1971, Ser. No. 168,577
Int. Cl. A47k *11/02*
U.S. Cl. 4—131 11 Claims



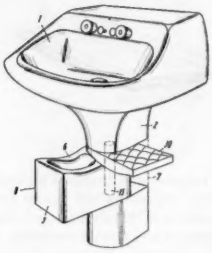
A compact, low cost, efficient gas fired incinerator toilet has a chassis within which is suspended an insulated firebox with which is associated an afterburner passage leading to a mixing chamber upstream relative to an exhaust fan and duct. A toilet seat is mounted on a cabinet top separably carried by the top of the chassis for ready access into the unit. Various operating and safety structures and controls are provided.

3,789,435
PREFABRICATED SWIMMING POOL
Mark Heisner, 651 N. Terrance Ave., Mount Vernon, N.Y.
Filed May 8, 1972, Ser. No. 251,448
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.19 8 Claims



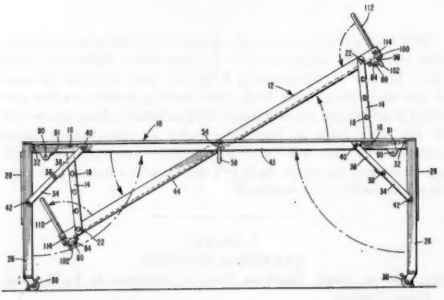
A prefabricated swimming pool is described which comprises steel walls and integral deck formed of prefabricated panels. A vinyl liner is employed to contain the water. The panels, which are generally of an inverted L-shape, are supported by an exterior truss construction where they are joined to adjacent panels, which simultaneously provides mounting means for a fence post permitting safe enclosure of the pool. The pool is especially adapted for above-ground use. Its modular construction also affords a wide variety of sizes. Among its main advantages are low cost, and fast installation without the need for skilled labor.

3,789,436
WASHING DEVICE
Hartmut-Wolfgang Maier-Gerber, Titusweg 1, 7501 Langensteinbach Baden, Germany
Filed Oct. 20, 1972, Ser. No. 299,202
Claims priority, application Germany, Oct. 20, 1971, 2152158
Int. Cl. A47k *1/04, 3/22, 11/08*
U.S. Cl. 4—166 9 Claims



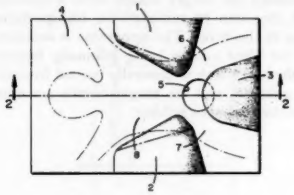
A washing device which comprises a washing basin and a seat washing basin. A mixing water feed feeds water selectively into said washing basin and into said seat washing basin, respectively. The washing basin and the seat washing basin are combined to a single functional unit including a single, joint armature battery controlling the mixing water feed and including a joint water waste for removing selectively waste water from the washing basin and from the seat washing basin, respectively. The seat washing basin includes means for moving the latter selectively into one of two positions, one of the positions constitutes a covered resting position and the other of the positions constitutes a use position.

3,789,437
FOLDING HOSPITAL BED
Gilbert M. Garte, 62 Curtis St., Situate, Mass.
Filed Jan. 11, 1972, Ser. No. 216,955
Int. Cl. A45f *1/00*; A61g *7/10*
U.S. Cl. 5—62 6 Claims



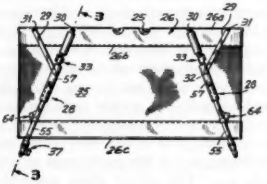
A folding bed including a main frame and an inner bed spring frame pivotally connected to the main frame at generally the longitudinal midpoint of said bed spring frame. The latter can be inclined relative to the main frame and locked in the desired position of adjustment. To store the bed, the inner bed spring frame can be disposed parallel to and within the main frame and the legs of the bed folded to provide a compact assembly. Inflatable pillows and mattress are stored in a deflated condition.

3,789,438
PROTECTIVE MATTRESS
Jean-Francois Hery, 5, Square Saint-Pasquier, Nantes, France
Filed Apr. 17, 1972, Ser. No. 244,455
Int. Cl. A61g 7/04
U.S. Cl. 5—91 9 Claims



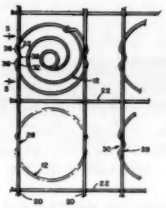
A protective mattress having an upper face comprising three thickened portions, which define therebetween three divergent channels which intersect, and an orifice at said insection whereby the body of a baby or ill adult may be disposed with the legs in two of said channels and the trunk in a third thereby to orient the body so that body wastes are discharged into said orifice without soiling the mattress user. The mattress may be complete or intended for support by a lower mattress.

3,789,439
FOLDABLE AND ADJUSTABLE CRIB
Donald P. Berg, Shaker Heights, and Hugh F. Groth, Brecksville, both of Ohio, assignors to Cross-River Products, Inc., Croton-on-Hudson, N.Y.
Filed Oct. 27, 1972, Ser. No. 301,287
Int. Cl. A47c 27/08
U.S. Cl. 5—99 C 25 Claims



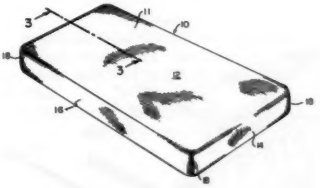
There is disclosed a crib which can be folded into a highly compact form, and which can be converted for use as a playpen or a dressing table with a minimum of effort. The unit includes four legs each of which is pivoted at its upper end to a side of a foldable rim, and each of which has a link which connects another point on the same side of the rim to an intermediate point on the leg. Between those pivot points on the leg connected between the rim and the link there is provided a hinge joint which permits the two sections of each leg to be rotated 180° relative to each other. At a point further below the link pivot on each leg, there is provided another link which connects the leg to the side of a floorboard section. The four lower links permit the floorboard to be switched between two distinct positions with a minimum of effort.

3,789,440
SPRING ASSEMBLY
Harry A. Garceau, Charlton City, Mass., assignor to Webster Spring Co., Inc., Oxford, Mass.
Continuation-in-part of Ser. No. 97,733, Dec. 14, 1970, Pat. No. 3,662,411. This application May 11, 1972, Ser. No. 252,185
Int. Cl. A47c 23/02
U.S. Cl. 5—256 2 Claims



A coiled spring structure comprising a wire frame to which there are attached spaced pairs of longitudinally and transversely extending wires providing at their intersections end supports for the ends of coiled springs and coiled springs having end loops provided with diametrically disposed, reversely bent segments adapted to be sprung into engagement with the wires at the seats.

3,789,441
FITTED CONTOUR NO-IRON SHEET CONSTRUCTION
Sidney Matthew Weiss, c/o The Griswald-Eshleman Co., 655 Madison Ave., New York, N.Y.
Filed Jan. 24, 1972, Ser. No. 220,153
Int. Cl. A47g 9/00; A47c 23/00
U.S. Cl. 5—334 C 6 Claims



A fitted contour no-iron sheet is provided for mattresses, studio couches and the like, comprised substantially of cotton knitted fabric, having balanced two-way stretch characteristics. The sheet is made from a single piece of fabric, devoid of any separate pieces or elastic additions and is formed after cutting by four simple corner stitches. In addition, a conventional border stitching of the rolled edges of the sheet may be provided. The formed contour sheet will conform to several size mattresses and can be fitted without raising the mattress edges. The sheet of the invention is particularly appropriate for hospital beds because the stretch characteristics eliminates strain on corner construction and the usual failure thereof by the raising and lowering of hospital beds to a variety of positions. Furthermore, the sheet conforms to the mattress in its various raised positions.

3,789,442

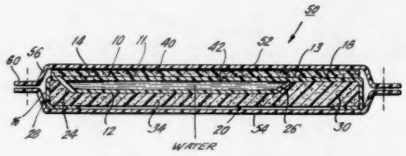
LIGHT-WEIGHT MINIMUM VOLUME WATER PAD WITH INTEGRAL WATER CONTAINER SECUREMENT MEANS

Sidney Tobinick, Oldbridge, N.J., assignor to Aqua Therm Products Corporation, Rahway, N.J.

Continuation-in-part of Ser. No. 199,853, Nov. 18, 1971, Pat. No. 3,702,484. This application Oct. 26, 1972, Ser. No. 300,917

Int. Cl. A47c 27/08

U.S. Cl. 5—348 WB 11 Claims



A low liquid volume, low weight liquid or water pad for use as a mattress comprised of a lower cellular foamed material flexible pad, which is hollowed out for receiving a flexible material, liquid filled container. The lower pad has an unhollowed extension portion for a user's head, upper body, or the like, which the liquid container does not rest on. The liquid container includes edge flaps which are wrapped around edges of the lower foam pad to secure the liquid container in position. Extending across the lower pad, the hollow therein and the liquid container is an upper flexible pad of the same cellular foamed material. The entire aforesaid structure is enclosed within a flexible, water impervious sheath which is loaded with the structure through openings in the ends of the sheath. The end openings are secured closed.

3,789,443

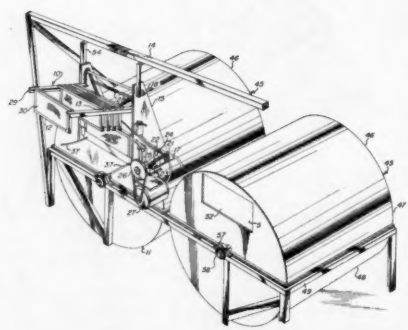
HONEYCOMB DECAPPING AND HONEY EXTRACTING APPARATUS

John F. Cowen, P.O. Box 206, Parowan, Utah

Filed July 28, 1972, Ser. No. 276,047

Int. Cl. A01k 51/00

U.S. Cl. 6—12 A 20 Claims



In general this apparatus includes means for removing the wax caps from honeycombs, moving the decapped combs from the decapping means into apparatus for extracting the honey from the decapped combs and moving the empty combs from the extracting apparatus for cleaning, if necessary, and replacement in the hives. More specifically, the apparatus has a plurality of extracting units disposed in side-by-side relation, each unit having a cylindrical casing with a rotatable reel inside. The reel has guide tracks for receiving and holding decapped combs while rotative movement is imparted to the reel to centrifuge the honey from the combs. Drive means serve to alternately rotate the reels, and while each reel is stationary a decapping device is registered with a loading station of the extractor and operated to decap the combs and load them onto the stationary reel. The loading operation also serves to unload the empty combs onto a conveyor holder from which they can be removed for transportation to and replacement in the hives. The apparatus is semiautomatic in operation, the filled combs being manually loaded into the decapping device, which is manually moved from one extractor unit to another, and the empty combs are manually unloaded from the conveyor holder.

3,789,444

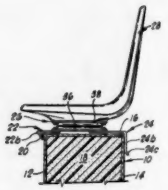
BOAT SEAT HOLDER ASSEMBLY

Byron McCord, 2045 Phoenix Ave., Camden, Ark.

Filed July 7, 1972, Ser. No. 269,710

Int. Cl. B63b 29/00

U.S. Cl. 9—7 1 Claim



A boat seat holder assembly including a pair of bracket plates, and a swivel plate seat mounting assembly interconnecting the bracket plates. The bracket plates include a forward plate having a substantially monoplanar main plate portion having apertures therethrough, and having a turned over flange at the forward edge thereof defining with the main plate portion an angle of less than 60°. A second or rear bracket plate has a substantially monoplanar main plate portion having apertures therethrough, and having a first flange portion bent from and extending at a right angle to, said main plate portion. The flange portion has at its free edge, a turned out, finger grip portion. The front and rear bracket plates cooperate in fitting across the permanent seat of a boat and gripping such seat. The swivel plate assembly supports a swiveling fisherman's chair or seat for accommodating a fisherman sitting in the boat.

3,789,445

BUOY CONSTRUCTION

Larry Vane W. Frazier, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

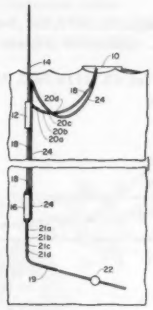
Filed Nov. 12, 1971, Ser. No. 198,138

Int. Cl. B63b 21/52

U.S. Cl. 9—8 R 2 Claims

A vertically disposed tube having valves at each end and suspended in the ocean for the purpose of creating dynamic

system stability. When the valves are closed, water is trapped in the tube and forms a large mass which is added to the



system. If both valves are open, water flows freely through the tube with no vertical stability added to the system.

3,789,446

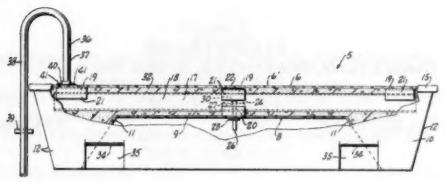
UNSINKABLE RAFT

John Rudelick, Milwaukee, Wis., assignor to Multi-Pro, Inc., Milwaukee, Wis.

Filed Dec. 16, 1971, Ser. No. 208,745

Int. Cl. B63c *9/04*

U.S. Cl. 9—11 R **5 Claims**



An unsinkable raft comprising a plastic foam filled hull capped by a flat deck. An inwardly displaced bottom portion of the hull provides a substantially large central cavity in its underside which enhances the buoyancy and stability of the raft. The bottom of the cavity is spaced a distance beneath the deck, and an anchor line attaching eye disposed at its underside, is attached to an elongated girder confined in the space under the deck, so that the pull of an anchor line will be transmitted to surfaces of substantial area in the interior of the body.

3,789,447

SWIMMING ACCESSORY

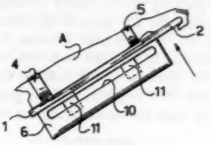
Viateur Lavallee, 5305 Forget St. Louis de, Terrebonne, Quebec, Canada

Filed Dec. 12, 1972, Ser. No. 314,415

Int. Cl. A63b *31/06*

U.S. Cl. 9—303 **4 Claims**

A swimming accessory adapted to be secured to one's limb, such as an arm, and including a pair of fins which are apertured to allow the water to pass therethrough during the negative or back stroke and which are of buoyant construction to supplement the buoyancy of the user thereof. A swimming limb accessory including an elongated board, bands secured to the board to attach the same to a limb, leg or arm, a pair of fins each having an aperture therethrough and integrally constructed and hinged to the board to cause the apertures to close during the positive stroke and to cause the same to open



during the back stroke to then reduce the negative water action thereon, and spring blades arranged to resiliently restrain the pivoting of the fins away from the board.

3,789,448

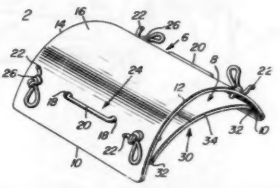
FOOT AND HAND MOUNTED SWIMMING AIDS

James P. Mitchell, Rt. 1 Box 16, Hepler, Kans.

Filed Nov. 14, 1972, Ser. No. 306,453

Int. Cl. A63b *31/04*

U.S. Cl. 9—307 **4 Claims**



A swimming aid for hand and foot propulsion characterized by suitably aligned first and second bendably resilient plastic sheets. The second sheet is smaller in plan than the first sheet. These two sheets are arcuately bowed and laced together in a manner to clampingly and retentively embrace the swimmer's wrist or foot, as the case may be. The overlapping and overhanging marginal portions of the first sheet provide propulsion flippers. The free ends of the cord-type laces can be, and preferably are, used to tie and retain the swimming aid in ready-to-use position.

3,789,449

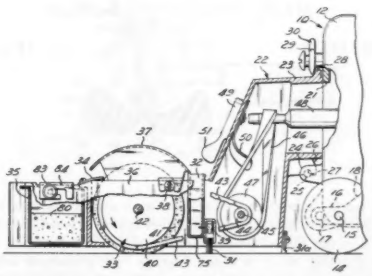
HARD SURFACE FLOOR CLEANER

Charles H. MacFarland, and Alexander A. Papp, both of Cleveland, Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed June 21, 1972, Ser. No. 264,840

Int. Cl. A47l *11/292*

U.S. Cl. 15—4 **9 Claims**



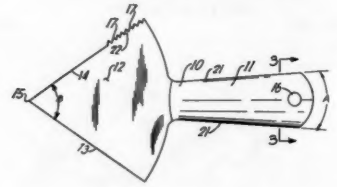
A hard surface floor cleaner which is capable of being detachably mounted to the motor housing of a vacuum

cleaner is disclosed. The floor scrubber includes a liquid dispenser for flowing a quantity of liquid detergent onto the floor, a scrubbing brush, and a power driven, open cell polyurethane roll for picking up the liquid detergent and dirt from the floor. A receptacle for picked up detergent and dirt is mounted ahead of the roll and a shear blade is mounted between the receptacle and the roll. An edge of the shear blade contacts the surface of the roll for shearing detergent and dirt therefrom and depositing detergent and dirt in the receptacle. An air blast assists in drying the floor.

3,789,450
PAINTER'S PAL

Bernard Mozdenski, and Bernard T. Mozdenski, both of Long Island, N.Y., assignors to The Raymond Lee Organization Inc., New York, N.Y., a part interest

Filed Feb. 29, 1972, Ser. No. 230,438
Int. Cl. A47l *25/00*; B25f *1/00*
U.S. Cl. 15—105 **2 Claims**

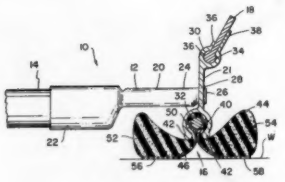


A painter's tool comprising an angular shaped metal blade fastened by a plastic or wooden handle. The blade is pointed with one edge being of straight configuration, and the second edge being of straight configuration for a section of said edge with protruding angular shaped teeth on a portion of said second blade edge, said protruding teeth being of use in the cleansing of paint brushes. The straight edges and points of the blade are of use in scraping paint from the surfaces to be repainted. The sides of the brush handle diverge from each other at an eight degree angle so as to furnish a desirable grasping surface.

3,789,451
WINDOW CLEANING IMPLEMENT

Walter William Laitner, Grosse Pointe, Mich., assignor to Laitner Brush Company, Detroit, Mich.

Filed May 26, 1972, Ser. No. 257,199
Int. Cl. A47l *1/08*
U.S. Cl. 15—118 **1 Claim**

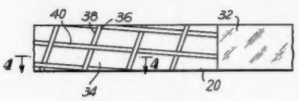


A portable implement for cleaning a smooth surface such as a vehicle windshield. An absorbent member is folded upon itself and the folded portion is clamped to a supporting frame. An abrasive sheet is folded inside the absorbent member. When pressed against a smooth surface, the absorbent member spreads out to subject the surface to the combined washing and abrading action of the abrasive sheet and the absorbent member.

3,789,452
TAPE AND CASSETTE FOR CLEANING MAGNETIC RECORDING HEADS

Tsuneo Nemoto, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 17, 1971, Ser. No. 181,342
Claims priority, application Japan, Sept. 18, 1970, 45-92601
Int. Cl. G11b *5/00, 3/58*
U.S. Cl. 15—210 R **9 Claims**

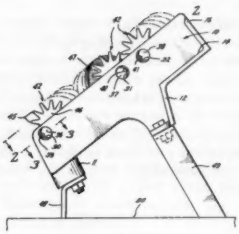


A tape cassette for use in recording and reproducing apparatus having magnetic heads adapted to be engaged with tape in the cassette includes a generally hollow case, a pair of tape reels rotatably mounted therein, and a magnetic head cleaning tape having its ends respectively secured to the reels for winding thereon. The tape has a base formed of a nonwoven fibrous material and a plurality of reinforcing threads are located on at least one side thereof for engaging the magnetic head during operation of the apparatus to wipe the head and remove dust and other impurities therefrom.

3,789,453
CLEAT CLEANER

Gerald J. Curtis, 8806 Glen Loch, Houston, Tex.

Filed Mar. 10, 1972, Ser. No. 233,594
Int. Cl. A47l *23/26*
U.S. Cl. 15—237 **10 Claims**



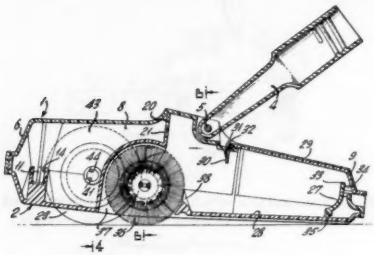
A shoe cleat cleaner comprises an inclined, hollow base having a plurality of inclined axles held by the base, each of the axles inclined at an angle between 20° and 30° from right angles between the two sides of the base wherein one axle is inclined from one side of the base and the other axle is inclined from the opposite side of the base, and a plurality of rotatable cleaning members on each axle, the cleaning members being preferably emery dressing wheels but which may also be wire brush wheels, the cleaning members extending above the top of the base and spaced from one other and each cleaning member adapted to wobble on the axle and rotate thereon.

3,789,454

CARPET SWEEPER

Robert E. Drappeu; Hughjean Burton Gould, both of Berwyn, and Daniel A. Maust, Winfield, all of Ill., assignors to The Drackett Company, Cincinnati, Ohio

Filed July 7, 1972, Ser. No. 269,632
Int. Cl. A47l *11/00*
U.S. Cl. 15—41 R 5 Claims



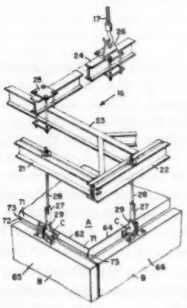
The subject invention relates to a carpet sweeper having a minimum of parts, most of which are molded completely of plastic. The sweeper is provided with a dust collecting bin having a lid which provides easy access from the upper portion of the sweeper. A simple gear system transmits rotating motion directly from the wheels to the rotating brush. The housing consists of an upper and lower portion which are both constructed of a molded plastic material. The upper portion has provision to accomodate the dust bin lid and the lower portion has integrally molded means to mount the brush and brush drive system.

3,789,455

METHOD OF AND MEANS FOR MULTI-UNIT BUILDING CONSTRUCTION

Oleg V. Miram, 759 Flood Building, San Rafael, Calif.

Division of Ser. No. 134,623, April 16, 1971, Pat. No. 3,724,157. This application Aug. 21, 1972, Ser. No. 282,398
Int. Cl. E04g *21/14*
U.S. Cl. 16—128 R 1 Claim



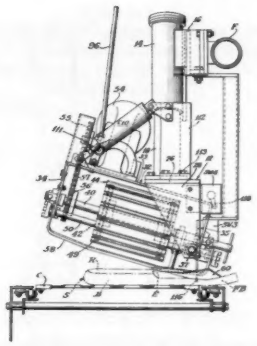
A method of constructing buildings of modules is disclosed in which the modules are formed of overhead and wall panels fabricated with means embedded therein having no portion extending beyond the boundaries thereof for distributing the weight thereof to a plurality of points spaced from each other along their edges, which edges are mechanically interconnected by removable hinge joinder means extending between the embedded means in adjacent panels when they are in selected juxtaposition. Means for raising the overhead panels to an elevated position including said removable hinge joinder means are described. Preferred means for forming the overhead and wall panels in the selected juxtaposition and preferred removable hinge joinder means are disclosed. Preferred methods and means for interconnecting vertically and horizontally adjacent modules into structural units of the final building structure before or after removal of said removable hinge joinder means are described.

3,789,456

RIB CUTTING APPARATUS

Richard E. Doerfer, Waterloo; Homer N. Leymaster, Cedar Falls, and Richard R. Neebel, Waterloo, all of Iowa, assignors to Doerfer Corporation, Cedar Falls, Iowa

Filed Sept. 9, 1971, Ser. No. 178,914
Int. Cl. A22c *17/00*
U.S. Cl. 17—1 R 13 Claims



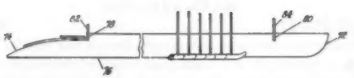
An animal processing machine including rib cutting apparatus constructed and arranged so as to optimize the rib portion cut from an animal side. The rib cutting apparatus includes a frame having a movable conveyor thereon operable to convey an animal side to a rib cut knife. Driven rotatable means urge the animal side against the conveyor. The rib cut knife is mounted at an angle relative to the direction of conveyor travel and is adapted to be tilted relative to the animal side and then raised from the animal side to provide a desirable taper on the end of the cut ribs.

3,789,457

METHOD AND APPARATUS FOR EVISCERATING CLAMS

Harold F. Snow, R.D. 4 Pine Pt., Scarborough, Maine

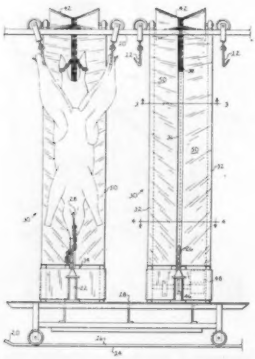
Filed Apr. 17, 1972, Ser. No. 244,616
Int. Cl. A22c *21/00*
U.S. Cl. 17—48 13 Claims



Evisceration of clams is accomplished by positioning a clam on a conveyor belt with the clam root at the trailing end; bringing the clam under a skate bar positioned over the belt and longitudinally in relation to the belt travel, the skate bar pinning the clam against the belt while the clam slides along the bottom of the skate bar with the clam muscles on opposite sides of the skate; pushing the clam muscles to the sides

further away from the skate bar by moving the clam under a V-shaped plow mounted in conjunction with the skate bar over the belt, the plow having each leg of the "V" on opposite sides of the skate bar and its apex away from the direction the belt travel, the plow displacing the muscles to the sides and away from the skate bar as the remaining clam body slides under the plow and the skate bar; and eviscerating the clam by passing it between the belt and a pressure pad whereby force is applied to the pad and against the clam body between the muscles progressively from the leading end to the trailing or root end of the clam to squeeze out the viscera.

3,789,458
HOG SKINNING II
Kenneth J. Brown, P.O. Box 2036, Plainview, Tex.
Filed June 14, 1972, Ser. No. 262,527
Int. Cl. A22b *5/16*
U.S. Cl. 17—21 **7 Claims**

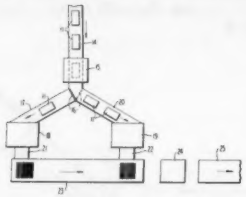


A series of hogs are hung by their hamstrings and moved progressively along a conveyor. The skin is cut from the belly, legs and head of each hog and then heads of the hogs, by pairs, are held down while the skins of the hogs, by pairs, are pulled upward. The skins are pulled upward over a tent-shaped backing to protect the mechanical portions of the puller from blood and offal.

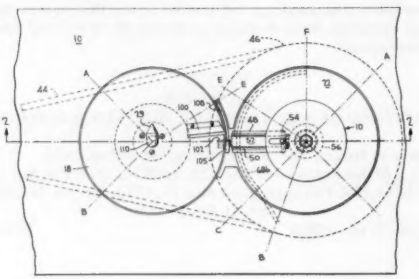
The skin is pulled over a double cone-shaped roller at the top so the skins are channeled to the center in this area.

3,789,459
METHOD AND APPARATUS FOR INCREASING PORTION YIELD FROM INDUSTRY STANDARD FROZEN FISH BLOCKS
John F. Krakowski, Waltham, Mass., assignor to Methods, Inc., Smyrna, Del.
Filed Oct. 31, 1972, Ser. No. 302,596
Int. Cl. A22c *25/18*
U.S. Cl. 17—52 **8 Claims**

Industry standard size and weight frozen fish blocks, usually slightly overweight, are conveyed over an automatic weigher which will record the excess weight in each block over that weight needed to produce the required number of portions from the block. As successive blocks pass over the weigher, each will have its overweight added, or its underweight subtracted, with reference to the weight necessary to produce the required number of portions. When the automatic weigher records from a number of blocks an accumulated overweight equal to the weight of one strip taken from a block to produce a given number of portions, an automatic diverting means associated with the weigher will divert one block to a stripping saw which will produce from that block one extra strip in comparison to a second saw which receives and processes all other blocks in the procession crossing the automatic weigher.



3,789,460
CRAWFISH PEELER
Edgar J. Ingalls, Kendalwood Rd., Baton Rouge, La.
Filed Jan. 19, 1972, Ser. No. 218,871
Int. Cl. A22c *29/00*
U.S. Cl. 17—73 **6 Claims**



Pairs of grippers for operative engagement with the tail and head ends, respectively, of a crawfish are supported for movement in synchronized relation through separate but tangentially related orbits wherein both pairs of grippers simultaneously move in a common direction through or past the point of tangency of their respective orbits. Thus a crawfish, the tail of which is placed in the tail grippers with its head projecting therefrom, will be carried toward the point of tangency to place its head in the head grippers, which will then be closed approximately at the point of tangency to then remove the head during continued movement of both pairs of grippers through and past the point of tangency, leaving the meat within the portion retained in the tail grippers. A nozzle which penetrates the tail section of the shell, then injects a blast of air into the shell to eject the meat. The deveining pin on which the shell and meat are impaled when initially placed in the tail grippers, functions to open and remove the sand vein from the crawfish incident to its ejection under the influence of the air blast. During continuance of their rotation, and before again approaching the point of tangency, the tail grippers are opened to release the empty shell segment therefrom and to receive a fresh crawfish. The head grippers are similarly opened to discharge the head.

3,789,461

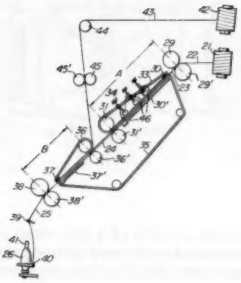
APPARATUS FOR PREPARING SPUN YARN

Hiroshi Nakano, Suita; Hideo Takai, Fuji, and Fumio Nakajima, Yoshiwara, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 618,469, Feb. 24, 1967, Pat. No. 3,596,458. This application Mar. 18, 1971, Ser. No. 125,524

Int. Cl. D01g *1/08*; D01h *5/86*

U.S. Cl. 19—.35 3 Claims



Apparatus for preparing spun yarn comprising back rolls for feeding fiber from a supply thereof to front rolls spaced from the back rolls and serving to draft fiber received therefrom. A stretch breaking zone and a draft zone are arranged in succession in that order between the back rolls and the front rolls. An endless bottom apron extends between the back rolls and front rolls over the stretch breaking zone and the draft zone, and the bottom apron passes on respective support plates adjacent the back rolls and front rolls. Output rolls are mounted in the stretch breaking zone for drawing fiber from the back rolls and stretch breaking the fiber, and input rolls are provided in the draft zone for receiving fiber from the output rolls and for advancing the fiber to the front rolls. Both the input and output rolls include top and bottom rolls for advancing the fiber therebetween. The bottom apron extends on and is driven by the bottom rolls of the input and output roll means. A first top apron is mounted in the stretch breaking zone, and a second top apron is mounted in the draft zone, the first top apron passing on a further plate and on the upper roll of the output rolls in the stretch breaking zone and driven by the latter, the second top apron passing on a further plate and on the upper roll of the input rolls in the draft zone and driven by the latter. The first and second top aprons are opposed to the bottom apron to control the feed of the fiber therethrough.

3,789,462

ABRASIVE-FILLED DENTAL PROPHYLACTIC CUP

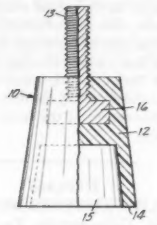
Charles Reich, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St Paul, Minn.

Filed Mar. 26, 1973, Ser. No. 345,101

Int. Cl. A61c *3/06*

U.S. Cl. 32—59 3 Claims

An abrasive-filled, paste-free dental prophylactic cup is formed from a urethane elastomer. The elastomer consists essentially of tolylene diisocyanate endcapped polytetrahydrofuran cured with 4,4'-methylene bis(o-chloroaniline). The elastomer has 25 – 50 percent by weight of pumice added to the elastomer as a dental abrasive. Prophylactic cups formed from the abrasive filled elastomer will perform a suitable dental prophylaxis without the addition of prophylactic paste.



3,789,463

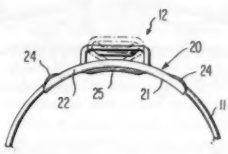
BRIDGING MEMBER FOR HOSE CLAMPS

Hans Oetiker, 21, Oberdorfstrasse, Horgen, Switzerland

Filed Nov. 19, 1971, Ser. No. 200,384

Int. Cl. B65d *63/02*

U.S. Cl. 24—20 CW 21 Claims



A bridging member for bridging the gap formed in the circumferential band portion of a hose clamp provided with an outwardly extending fold adapted to be contracted, whereby the bridging member consists of relatively thin material and includes a base portion adapted to abut against the radially inner surface of the band and side walls extending substantially at right angle to the base portion and provided with inwardly directed projections near the outer ends which can snap-in behind the outer surface of the band and thereby hold the bridging member in the assembled condition.

3,789,464

COUPLING RELEASABLE UNDER TENSION

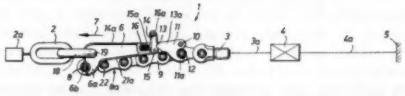
Heikki Collanus, Tampere, Finland, assignor to Oy Tampella Ab, Tampere, Finland

Continuation of Ser. No. 121,463, March 5, 1971, abandoned. This application May 8, 1972, Ser. No. 251,335

Claims priority, application Germany, Mar. 7, 1970, 2010806; Mar. 7, 1970, 2010807

Int. Cl. B60d *1/00*

U.S. Cl. 24—68 CT 10 Claims



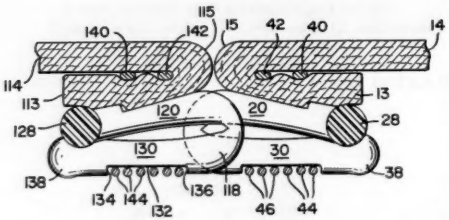
A coupling arrangement capable of being released while the coupling is under considerable tension and particularly adapted to connect an object to a roller chain or similar device having at least two cross elements like the rollers of a chain. A

lever has an offset front end which engages one of the cross members and has a coupling element pivoted to its other end to engage the other crossed element. The offset end of the lever is recessed to pivotally engage the first cross element and the coupling element has a recess which engages under the second cross element. The line of force between the lever and object is offset to one side of the first cross element to provide a moment of force that assists pivoting the lever to a released position about the first cross element. A spring urged latch normally maintains the coupling element in its locked position in which pivotal movement of the lever about the first cross element is prevented.

3,789,465
SLIDE FASTENER DEVICE

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Filed July 17, 1969, Ser. No. 842,529
Int. Cl. A44b *19/10, 19/34*
U.S. Cl. 24—205.1 C **6 Claims**

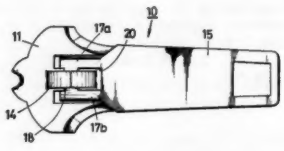


A seam type closure for a slide fastener device having a stringer of filamentary material constructed with a series of head portions interconnected with a series of heel portions by a plurality of leg elements, and having a carrier tape secured to leg elements by stitching threads which pass through a layer of the carrier tape that is disposed to overlie only one of each pair of the leg elements.

3,789,466
CAM-LOCK SLIDER

Koichi Watanabe, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1973, Ser. No. 331,072
Claims priority, application Japan, Feb. 16, 1972, 47-019321[U]
Int. Cl. A44b *19/30*
U.S. Cl. 24—205.14 A **1 Claim**

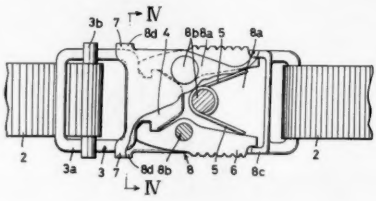


A cam-lock type of slider for slide fasteners is disclosed which includes a pull tab provided with a pair of laterally spaced cams for urging the fastener elements into locking engagement with a recess in the rear wing of the slider. The cams are formed by press into a rigid structure wherein the cams are bridged together and reinforced throughout their entire length against forces tending to distort or deform the same.

3,789,467
HELMET CHIN STRAP

Norio Aratani, Kawasaki, and Masaki Nakano, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 29, 1972, Ser. No. 230,440
Claims priority, application Japan, Mar. 1, 1971, 46-12052
Int. Cl. A44b *11/26*
U.S. Cl. 24—230 AT **4 Claims**



First and second portions of a chin strap of a helmet are respectively connected to first and second engaging members of a buckle connector. The first engaging member includes a projecting portion and the second engaging member includes a pair of pivotal claws for engaging the first engaging member. A spring acts on the claws to urge the claws to an operative position in which the first engaging member is engaged by the claws. The first engaging member is guidably engaged by side walls on the second engaging member in the course of engagement and disengagement with the claws to restrict lateral movement of the first engaging member.

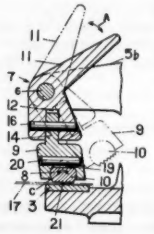
ERRATUM

For Class 24—230 AL see:
Patent No. 3,789,492

3,789,468
TENTER CLIP

Shigeaki Takasaki, Amagasaki, Japan, assignor to Kaneshigi Tenter Clip Co., Ltd., Amagasaki, Hyogo, Japan

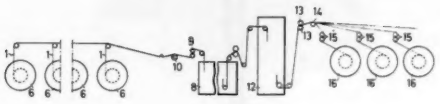
Filed Feb. 23, 1972, Ser. No. 228,572
Claims priority, application Japan, Feb. 26, 1971, 46-45944
Int. Cl. D06c *3/04*
U.S. Cl. 26—62 B **10 Claims**



Tenter clip comprising a pressing vane having at the bottom thereof a longitudinal groove of semicircular cylindrical shape, with an aperture on its side for fitting a pin therein, an interchangeable pressing member having a notch parallel with or at a certain angle to a recess in the vane, with interchangeable parts allowing different materials to be securely clipped, such as thick or thin materials (cloth or film), those with a

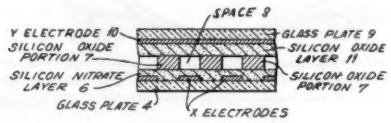
varying thickness, and/or high- or low-friction material surfaces (e.g., slippery sheets).

3,789,469
YARN TREATING METHOD
Mikio Kodama, Shizuoka, Japan, assignor to Fuji Spinning Co., Ltd., Tokyo, Japan
Filed Feb. 15, 1972, Ser. No. 226,490
Int. Cl. D02h 9/00; 5/02
U.S. Cl. 28—72.6 **4 Claims**



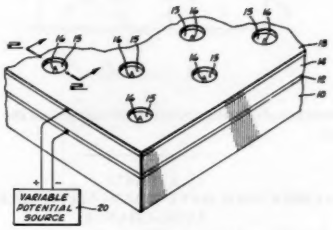
A plurality of sheet-like yarn groups each consisting of a number of parallel yarns are drawn out from respective supply beams and laminated in layers to form a laminated yarn group. The laminated yarn group is divided into a plurality of parallel narrow yarn groups and subjected to treatment in liquid. Each treated narrow yarn group is wound up on an associated take-up beam.

3,789,470
METHOD OF MANUFACTURE OF DISPLAY DEVICE UTILIZING GAS DISCHARGE
Kenichi Owaki; Kentaro Kiyozumi, and Norihiko Nakayama, all of Akashi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation-in-part of Ser. No. 832,062, June 11, 1969, abandoned. This application June 25, 1971, Ser. No. 156,930
Claims priority, application Japan, June 12, 1968, 43-40428
Int. Cl. H01j 9/18
U.S. Cl. 29—25.13 **1 Claim**



Each of a pair of spaced glass insulating substrate components has a plurality of mutually isolated conductive electrode layers on a surface thereof. Each surface faces the other and each plurality of electrode layers face the other. A layer of insulating material is applied to cover the electrode layers on each surface. A plurality of spaces are etched in a second layer of insulating material. The second layer is positioned between and joins the first layers of insulating material with the spaces between such layers sealed air tight, so that ionizable gas fills the spaces.

3,789,471
FIELD EMISSION CATHODE STRUCTURES, DEVICES UTILIZING SUCH STRUCTURES, AND METHODS OF PRODUCING SUCH STRUCTURES
Charles A. Spindt, Menlo Park; Kenneth R. Shoulders, Woodside, and Louis N. Heynick, Palo Alto, all of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.
Division of Ser. No. 9,139, Feb. 6, 1970, Pat. No. 3,755,704. This application Jan. 3, 1972, Ser. No. 215,068
Int. Cl. H01j 9/02
U.S. Cl. 29—25.17 **2 Claims**

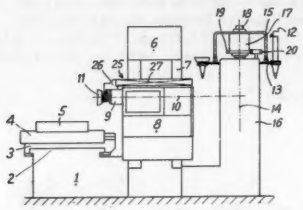


Vacuum devices incorporate electron or field forming sources formed by a cellular array of emission sites. The sources comprise a metal/insulator/metal film sandwich on a substrate with a cellular array of holes through the upper metal and insulator, leaving the edges of the upper metal electrode effectively exposed to the upper surface of the lower metal electrode. Sharp protuberances directed toward the upper electrode and constituting emitter tips of controlled configurations are formed on the exposed area of the lower electrode. A method of forming the structure includes starting with the metal/insulator/metal film sandwich having the cellular array of holes already formed and directing permanent electrode material into the cellular array of holes and masking or subsequently removable material onto the surface surrounding the holes whereby an individual sharp cone-like emitter is formed within each of the holes in the cellular array. Vacuum devices are formed from such structures. For example, a diode is formed either by making the masking material over each emission site an electrode or by removing the masking material and applying a conductive electrode material over each emission site.

3,789,472
DEVICE FOR AUTOMATICALLY CHANGING TOOLS
Pierre Pegard, Courbevoie, France, assignor to Ateliers G.S.P. (Guillemin, Sergot, Pegard), Courbevoie, France
Filed Aug. 24, 1971, Ser. No. 174,314
Claims priority, application France, Sept. 3, 1970, 7032105
Int. Cl. B23q 3/157
U.S. Cl. 29—568 **7 Claims**

A device for automatically changing tools which can be used with a machine which has at least one substantially horizontal tool holder, the device including a transfer mechanism for transferring the tools from a tool holder to a magazine, and having a clamp with jaws which are capable of gripping and holding a flange projecting from the tool, and which, while the machine is in operation, are open and located on opposite sides of the flange of the tool mounted in the tool holder, the tool having a projecting main plate, which is of the same shape as the flange and which is so arranged in front of the flange that it defines with the latter an opening into which a jaw of the clamp can enter, the main plate being located

when a tool is mounted in the tool holder in the same plane as a pair of plates on the holder to form a protector against the



penetration of shavings between the flange and the jaws of the clamp.

3,789,473

MACHINE TOOL HAVING AUTOMATIC MEANS FOR TOOL-CHANGE

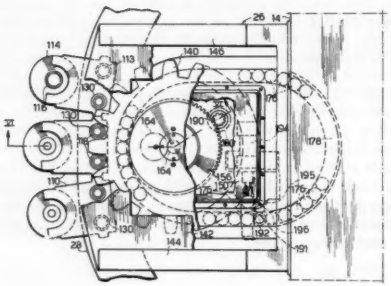
Elio Pagella, and Giorgio Ollearo, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Torino, Italy

Filed Oct. 15, 1971, Ser. No. 189,501

Claims priority, application Italy, Oct. 31, 1970, 70639 A/70

Int. Cl. B23q *3/157*

U.S. Cl. 29—568 **17 Claims**



A machining center has a tool magazine in the form of an endless track. The tools are each mounted in an individual carriage, the carriages being packed end-to-end in the track and being drivable along it. A tool-change station is defined by a gap in the track from which one carriage may be removed for insertion of the tool into the machine spindle. A main tool-change incorporates a section of the track which completes the magazine track when this arm is in one position, and an auxiliary or carrier arm completes the track when the main arm is located away from the track. To avoid direct reading of the tools or carriages (which change their order in the magazine as tools are used and replaced) a simulator track is provided along which elements simulating the tools or carriages are driven simultaneously with the drive to the carriages. A reading device reads distinctive indicia on the simulator elements as they pass a reading station, and a signal is generated which governs the movement of the carriages and simulator elements. When a simulator element corresponding to a fresh tool required is read, the drive is stopped with this tool in the correct position for the first stage of tool-change.

3,789,474

METHOD FOR JOINING CROSSWISELY EXTENDING REINFORCING BARS

Mats Folke Skold, Backvagen 78, Hagersten, Sweden

Filed Feb. 28, 1972, Ser. No. 229,702

Claims priority, application Sweden, Mar. 2, 1971, 2618/71

Int. Cl. B23p *17/00*

U.S. Cl. 29—155 R **2 Claims**

Method for elevating and joining crosswisely extending reinforcing bars and supporting them in a position raised above the deck of the casting mold in a spacing member having an inverted generally U-shaped body and rod engaging recesses.

3,789,475

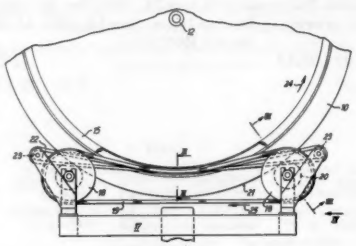
METHOD OF AND APPARATUS FOR TRUING SPOKED WHEEL

Ian John Barwell, Lae, Guinea, assignor to Raleigh Industries Limited, Nottingham, England

Filed Jan. 5, 1973, Ser. No. 283,034

Int. Cl. B21f *39/00*; **B21k** *1/34*

U.S. Cl. 29—159.02 **12 Claims**



A method and apparatus for truing a spoked wheel is disclosed whereby a hub and rim, after having spokes threaded and secured by nipples, are located in a clamping device and the spoke nipples are partially tightened by rotating the clamped wheel relative to a resilient band, then offsetting the hub relative to the rim in one direction and then in the other over a fixed distance and rotating the clamped wheel after each offsetting action to tighten further a series of the spoke nipples by causing them to rotate as they are contacted by the resilient band means and repeating the alternating offsetting actions and intermediate nipple tightening until the wheel becomes substantially true.

3,789,476

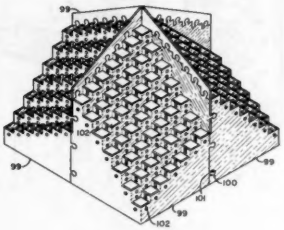
METHOD OF MANUFACTURING A NUCLEAR FUEL ASSEMBLY SPACER

Charles C. Ripley, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Division of Ser. No. 772,206, Oct. 31, 1968. This application Mar. 15, 1971, Ser. No. 124,319

Int. Cl. B23p *15/16*

U.S. Cl. 29—163.5 R 5 Claims



A method for manufacturing an expanded sheet spacer for nuclear fuel rod assemblies is presented. In general the method has the first step of forming a plurality of spaced slits along parallel lines on a sheet material so that each slit has a length of at least two times the distance between pairs of slits and the center of each slit is located adjacent the space between slits of the next line of slits. The second step of the method is bending the sheet below each slit perpendicular to the slits so that a portion of the sheet below each slit is displaced in the same direction away from the original plane of said sheet and a plurality of channels having axes substantially parallel to each other and to the plane of the sheet are formed.

3,789,477

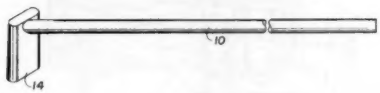
TOOL FOR INSTALLING DISC BRAKES

Carl W. Shadoan, Bloomington, Ill., assignor to The Raymond Lee Organization, New York, N.Y., a part interest

Filed July 24, 1972, Ser. No. 274,590

Int. Cl. B23p *19/00*, *19/04*

U.S. Cl. 29—200 P 5 Claims



A tool comprising: an elongated horizontal handle; and a vertical plate secured to one end of the handle, the handle being joined to the plate at an acute angle.

3,789,478

NEEDLE BEARING ASSEMBLING MACHINE

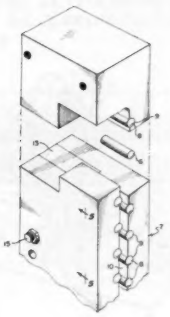
Donald R. Stenger, Rockford, Ill., assignor to Hill-Rockford Co., Rockford, Ill.

Filed Dec. 13, 1972, Ser. No. 314,513

Int. Cl. B23p *19/04*

U.S. Cl. 29—201 10 Claims

The needles or rollers are dropped by gravity through a so-called cascade into an annular space around a cylindrical centering pin and in front of a sleeve which is reciprocable with the centering pin to shift a collected set of needles into the ultimate bearing disposed in coaxial relationship to the pin and sleeve. The cascade has a narrow, zig-zag passageway extending vertically therethrough that is only slightly wider than the needles, and ledges are defined on opposite sides of this passageway in zig-zag relationship to one another the full length thereof, which by abutment with the needles insure their arrival at the discharge end always parallel to the centering pin. The ledges are all rounded, being defined by needles set in three-quarter round recesses defined in zig-zag relationship to one another the full length of the cascade, thus reducing wear on the ledges while also enabling replacement of



these few needles from time to time as the exposed portions thereof defining the abutments commence to show wear, so as to restore the cascade to new condition at a very low cost utilizing the same needles as are used in the needle bearings as replacements and insure continued good operation. Removable cover plates on the front and back of the cascade expose the ends of these needles so that removal and replacement of the worn needles presents no problem.

3,789,479

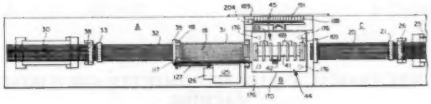
MACHINE FOR ASSEMBLING TUBES IN A HEAT EXCHANGER

Morton F. Zifferer, and Donald E. Flinchbaugh, both of York, Pa., assignors to Mordo Company, Mt. Joy, Pa.

Filed June 30, 1972, Ser. No. 268,088

Int. Cl. B23p *15/26*

U.S. Cl. 29—202 R 14 Claims



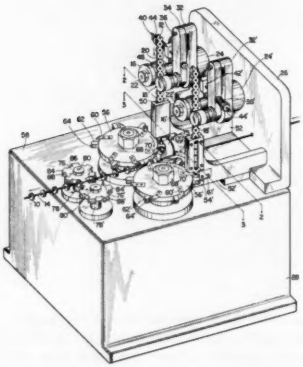
Machine for assembling automatically the tubes of a shell and tube type heat exchanger having many tubes of uniform length and a plurality of perforated baffle plates through which the tubes pass. A machine is provided having a tube holding fixture mounted on a work table. By means of opposing rods, selected quantities of tubes are transmitted successively from a tube supply to the fixture. Suitable controls are employed to complete one full tubular assembly during each operative cycle of the machine. The tubes are transmitted and assembled in the fixture in a single working plane. Following each deposit of tubes, the fixture is adjusted relative to the working plane preparatory to receiving the next quantity of tubes.

3,789,480

METHOD OF AND APPARATUS FOR APPLYING INSULATING DISCS TO CONDUCTORS

Rama Iyengar, Dollard des Ormeaux, Quebec, and Bretislav Paul Zuber, Montreal, Quebec, both of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Feb. 10, 1972, Ser. No. 225,100
Claims priority, application Canada, Nov. 29, 1971, 128860
Int. Cl. H01b *13/20*
U.S. Cl. 29—203 C 15 Claims



A method of and apparatus for applying insulating discs upon a continuously advancing conductor comprises advancing a continuous chain of discs towards a disc applicator station. First and second means carried by an applicator wheel sever individual discs from said chain and advance the discs along a predetermined path. Slitting means mounted in said predetermined path impart a slit to the disc and an arcuate guide member extending from the slitting means to the conductor enters the slit in the disc and gradually expands the slit to facilitate application of the disc upon the conductor.

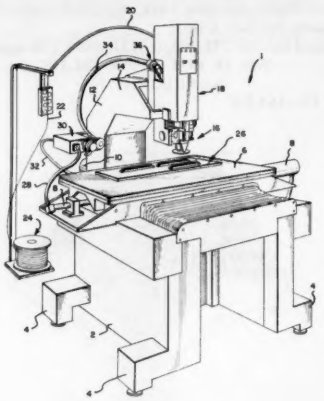
3,789,481

MECHANICAL ANALOGUE COMPUTER AND WIRING MACHINE

James Ray Coller, Mechanicsburg, Pa.

Filed May 24, 1972, Ser. No. 256,519
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 P 7 Claims

A wiring machine for bridging a discrete length of electrical wire between selected point-to-point locations of a printed circuit board and a mechanical analogue computer used to compute the length of wire required to bridge between the point-to-point locations. The machine includes a table which carries the printed circuit board for displacement along each of two orthogonal axes. The computer is responsive to displacement of the table and includes a system of gear trains for driving a wire feeding mechanism to feed a discrete length of wire corresponding to the length of table displacement along either of said orthogonal axes. When said table is diagonally displaced with respect to the orthogonal axes, the computer will drive the wire feeding mchanism to provide a length of wire equivalent to the length of such diagonal displacement,



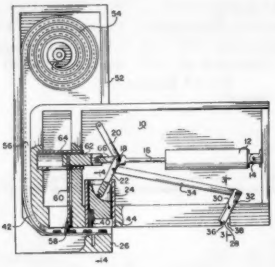
thereby providing discrete point-to-point wiring on the printed circuit board.

3,789,482

MACHINE FOR SPLICING COMMUNICATION CABLES

Jimmy C. Ray, Rt. 1 Box 226, Mineral Wells, Tex.

Continuation of Ser. No. 525,506, Feb. 7, 1966, abandoned.
This application Aug. 8, 1972, Ser. No. 278,757
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 D 7 Claims



The machine is for splicing communication cables. An anvil on a base plate and a hammer mounted for movement on the base plate crimps connectors therebetween. The connectors are attached to a web in a web holder. Feed means attached to the base plate feeds the connector between the anvil and hammer in pairs.

3,789,483

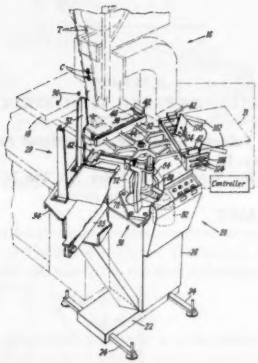
APPARATUS FOR FEEDING PRINTED CIRCUIT BOARDS

Raymond A. De Vita, Hamilton; Vincent P. Romeo, Danvers, and James E. Carney, Methuen, all of Mass., assignors to USM Corporation, Boston, Mass.

Filed Aug. 28, 1972, Ser. No. 284,280
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B 6 Claims

Assembly apparatus including mechanism for automatically supplying work pieces such as printed circuit boards sequen-

tially to one or more work stations from a stack and for thereafter unloading the boards seriatim whereby only a single operator is required. The mechanism may be a vertically movable, free-standing turntable or turret type for simultaneously serving a selected one or more stations, operation of any one of the stations desirably controlling the turret indexing



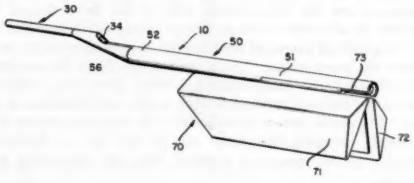
whereby the several stations operate simultaneously. The mechanism is adapted to service at least one work station optionally including an X-Y positioning table whereat successive boards during dwell times may be shifted to programmed component receiving positions prior to return to the turret feeding mechanism.

3,789,484

ELECTRICAL CONTACT TERMINAL HAND TOOL

Thomas Morgan, Los Angeles, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.

Filed Dec. 22, 1972, Ser. No. 317,513
Int. Cl. H01r *43/00*
U.S. Cl. 29—203 H **18 Claims**



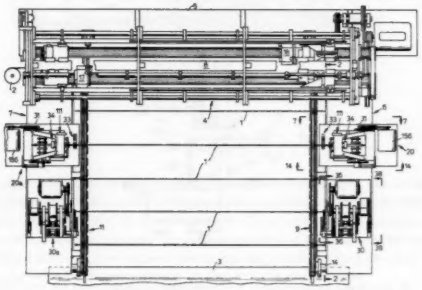
A tool is provided for facilitating removal and/or insertion of an electrical contact terminal of the type releasably lockable within a bore of an electrical connector body. A pair of elongated, hollow, half-cylindrical working members are mounted for movement between a closed position in which the members mate to form a uniform, open-ended, hollow, cylindrical working portion and an open position in which the working members are spread apart. In the open position the spaced working members are disposed for receiving a wire lead which may be connected to a contact terminal to be removed from, or inserted into, a bore in the connector body. In the closed position the hollow cylindrical working portion may be inserted into the bore without damaging the insulation surrounding the bore for releasing the contact terminal from its locked position therein. The working members are individually mounted on relatively rotatable hinge members having a pivotal axis radially spaced from the axis of said hollow cylindrical working portion, each of the hinge members being equipped with a pair of manually engageable wing grips or handles permitting selective manual movement of the working members between their open and closed positions.

3,789,485

METHOD AND APPARATUS FOR PRODUCING FLEXIBLE FIBER OPTICAL LIGHT CONDUCTORS

Ragnar Gudmestad, West Allis, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed Jan. 24, 1973, Ser. No. 326,380
Int. Cl. H01r *43/04, 9/00*
U.S. Cl. 29—203 D **21 Claims**



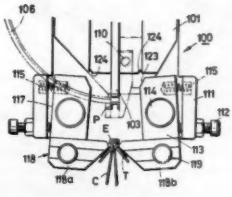
A stepwise advancing conveyor moves parallel fiber optical ribbons successively sidewise into endwise alignment with a ferrule attaching unit which during short periods of temporary standstill of the conveyor attaches a ferrule to the free end of each successive ribbon. Subsequent advance movement of the conveyor aligns the ribbon and attached ferrule with a cutting unit which trims the ferrule and ribbon end therein so as to provide the ribbon with a plane, light admitting and emitting end face.

3,789,486

END-STOP APPLYING APPARATUS FOR CONCEALED ZIP FASTENERS

Hisashi Douri, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

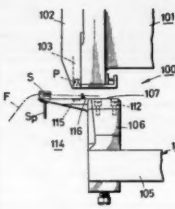
Filed Oct. 2, 1972, Ser. No. 293,995
Claims priority, application Japan, Oct. 2, 1971, 46/77308
Int. Cl. B23p *19/04*
U.S. Cl. 29—207.5 ST **5 Claims**



An apparatus is disclosed for applying end-stop members to concealed type zip fasteners in particular, which apparatus includes a pair of opposed spring-biased rocking arms provided with cam faces and a curling die removably mounted thereon. A reciprocating ram carries a clamping punch operatively associated with the die and movable through a pocket means

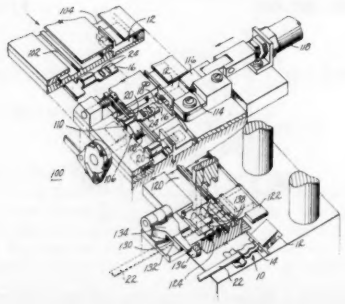
and forwarding end-stops one at a time therewith to a clamping position. The ram is provided with cam faces engageable with corresponding cam faces of the rocking arms to permit the opposed rocking arms to assume an upright position in which the plane of the die lies normal to the axis of movement of the punch.

3,789,487
SLIDER AND END STOP APPLYING MACHINE FOR A SLIDE FASTENER CHAIN
Koichi Kawakami, Toyama, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 27, 1972, Ser. No. 301,450
Claims priority, application Japan, Nov. 1, 1971, 46-87044
Int. Cl. B23p *19/04*
U.S. Cl. 29—207.5 SL **5 Claims**



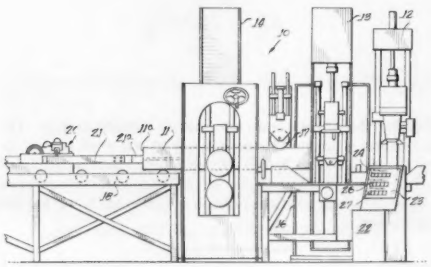
A machine is disclosed for applying a slider and an end stop in succession to a slide fastener chain on one and the same unit of the machine. The provision of a removably connected unit on the anvil part of the machine permits of the mounting of a slider and a bottom end stop as required on the fastener chain which has previously been attached to a prefinished garment such as trousers. The combination slider retainer and end stop die unit extends horizontally and forwardly of the anvil a sufficient length to provide unobstructed working space such that the fastener-attached, rather bulky garment can be advanced into the required position for the part assembly.

3,789,488
ASSEMBLY MACHINE FOR A SEAL
Sigurd M. Moberg, 91 Ridge St., Apt. 101, Orange, N.J.
Filed Aug. 30, 1972, Ser. No. 284,870
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 D **5 Claims**



A machine for assembly of the component parts of a seal of the type comprising a plastic body, a metal ferrule assembled with the body and a flexible shackle secured at one end to the ferrule. The machine comprises a pair of inclined feed tracks down which the ferrule and body slide to a first station where means is provided for forcing the two parts into non-removable assembly. The assembled pieces are then allowed to slide down to a second work station, where an end shackle is inserted into the ferrule and the ferrule deformed to retain the shackle. The assembly is then ejected from the machine.

3,789,489
APPARATUS FOR FABRICATING STRUCTURAL MEMBERS
Raymond L. Valente, Kankakee, Ill., assignor to Manco Mfg. Co., Bradley, Ill.
Filed Sept. 12, 1972, Ser. No. 288,257
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 C **9 Claims**

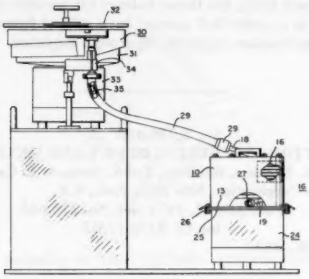


A machine for effecting fabrication of a structural member including tool means, drive means for advancing the structural member longitudinally of a work station, and apparatus for properly positioning the tool means with respect to a predetermined location on the structural member at which tooling operations are to be performed. A gear rack and rotary gear cooperate on the downstream side of the drive means to operate an encoder which produces pulses corresponding to the longitudinal extent of travel of the structural member as it passes the work station. The output pulses from the encoder are delivered to a readout control which gives visual indication of the distance traveled in feet, inches and fractions of an inch. The probe means includes pivotal actuating means for arcuately swinging the probe out of the way to facilitate removal of the structural member from the conveying apparatus.

3,789,490
STUD STORAGE SYSTEM
Ralph A. Kohart, Cherry Hill, N.J., assignor to Omark Industries, Inc., Portland, Oreg.
Filed Feb. 17, 1972, Ser. No. 227,122
Int. Cl. B23q *7/10*
U.S. Cl. 29—211 R **3 Claims**

A portable stud storage system for use with stud welding apparatus of the type employing a stud orientating apparatus which delivers studs to a stud feeding apparatus that in turn delivers studs to a stud welding gun for welding. The stud storage apparatus employs a housing and a coil of hollow tub-

ing into which the studs are fed, after orientation, at a first location, whereupon the loaded magazine is transported to a



remote second location and interconnected to the stud feeding apparatus at which the studs are discharged from the opposite end of the coil and fed to the stud welding gun.

3,789,491

APPARATUS FOR JOINING AND SUPPORTING CROSSWISELY EXTENDING REINFORCING BARS

Mats Folke Skold, Backvagen 78, Hagersten, Sweden

Continuation-in-part of Ser. No. 3,765, Jan. 19, 1970, Pat. No. 3,694,988. This application Feb. 28, 1972, Ser. No. 229,703

Claims priority, application Sweden, Mar. 2, 1971, 2619/71

Int. Cl. B23q *7/10*

U.S. Cl. 29—212 R **17 Claims**

Apparatus for joining crosswisely extending reinforcing bars at their intersection in preparation for casting concrete slabs and the like and supporting them in elevated position above the casting mold by means of a clip having an inverted generally U-shaped body in which the upper one of the bars is resiliently maintained in contact with the lower one of the bars which is seated in a recess, the axis of which extends transversely to and below the upper rod.

3,789,492

LOCK FOR MOTOR VEHICLE SAFETY BELT

Wolf-Dieter Klink, Danziger Weg 520, Lindach, Germany

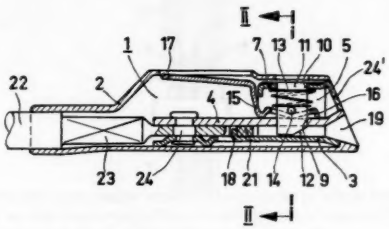
Filed Feb. 16, 1972, Ser. No. 226,714

Claims priority, application Germany, Feb. 17, 1971, P 21 07 666.4

Int. Cl. A44b *11/26*

U.S. Cl. 24—230 AL **3 Claims**

Lock for motor vehicle safety belt having a coupling member connected thereto, the coupling member being provided with a tongue-shaped insert portion insertable in direction of tension of the belt into the lock and formed with a through-opening therein, includes a lock member having a base plate, a pair of extension arms therefrom bent into the shape of a U and formed with recesses therein, and a support plate held in the recesses and extending spaced from and



parallel to the base plate; and a stop bolt mounted in the lock member and being axially displaceable against a spring-biasing force transversely to the insertion direction of the tongue-shaped insert portion so as to engage in the through-opening formed therein, the support plate having guide means for guiding the stop bolt transversely to the insertion direction.

3,789,493

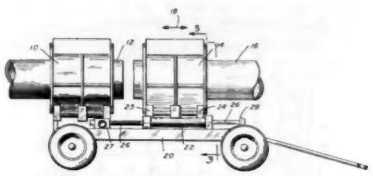
HYDRAULIC ACTUATED FUSION UNIT FOR PLASTIC PIPE

William F. Province, Bartlesville, Okla., assignor to The Ridge Tool Company, Bartlesville, Okla.

Filed Feb. 7, 1972, Ser. No. 223,855

Int. Cl. B23p *19/04*

U.S. Cl. 29—282 **3 Claims**



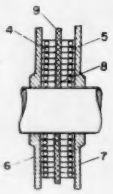
This invention describes an improved method of supporting and axially traversing a movable pipe clamping means in a fusion type plastic pipe joining apparatus. Two rods are provided, one on each side of the frame, on which are supported hydraulic cylinders. Pistons are mounted centrally on the rods and the cylinders are adapted to fit the pistons and also to seal along the rods which serve both as support and guide rods and as pistons rods. The movable pipe clamp is supported by the two cylinders and is adapted to slide axially supported on the two piston rods. The piston rods are drilled axially from each and so that hydraulic fluid can be inserted through the axial conduits into the cylinder spaces on each side of the pistons so that by applying pressurized liquid to one side or the other of the pistons the cylinders carrying the movable pipe clamp, and movable pipe section, can be traversed axially.

3,789,494

METHOD OF SPIRALLY WINDING STRIP TO PRODUCE PINNED UNITS

Bertil Ingemar Bostrom, Taby; Soren Folke Samuel Ljungdahl, Danderyd, both of Sweden, and Stellan Knoos, Malibu, Calif., assignors to AGA Aktiebolag, Lidingo, Sweden

Filed Apr. 24, 1972, Ser. No. 246,655
Int. Cl. B23p 15/26, 17/00
U.S. Cl. 29—423 17 Claims



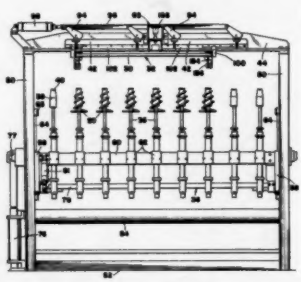
A design of finned units, intended for example for thermal regenerators, heat exchangers or burners for liquid fuel. The finned units are manufactured by simultaneous spiral winding of a strip forming fins and a spacer element forming a distance between the fins. The spacer elements are wholly or partially removed when fixing elements have been introduced in a number of holes distributed about the circumference. The cross-sectional area of each fixing element is equal to or smaller than the cross-sectional area of the corresponding holes in the fins. As a consequence thereof each fixing element prevents movement of the fins exclusively in a plane perpendicular to said fixing element.

3,789,495

METHOD FOR MANUFACTURING BOX SPRING

Walter Stumpf, Munster, Ind., assignor to Simmons Company, New York, N.Y.

Division of Ser. No. 829,533, June 2, 1969, abandoned. This application Jan. 18, 1972, Ser. No. 218,821
Int. Cl. B23p 21/00
U.S. Cl. 29—429 10 Claims



A method and apparatus for assembling box spring "constructions" by stapling rows of springs to a base frame. The method utilizes a wire spring coil in which the wire at one end of the coil is bent to cross the bottom convolution so that stapling gun inserted axially into the spring from the other end will secure the spring to the frame with one staple. The staple is driven with enough force to impress the cross-wire into the surface of the frame.

The apparatus handles the springs and frames upside down, the guns being lowered for loading with springs, and raised for firing. The gun muzzles are adapted to receive an inverted spring and to position it rotatively so that the staple when driven will encircle the cross-wire from which the spring is suspended on the gun.

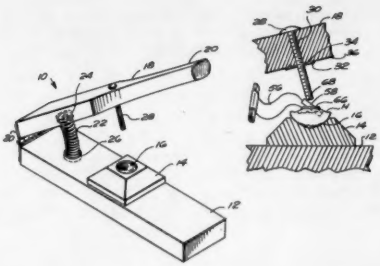
After each firing, the frame indexes for another row, and is followed at a controlled interval by a second frame brought into the mechanism automatically from a magazine.

3,789,496

BUTTON ASSEMBLING DEVICE AND METHOD

Andrew A. Barabas, Danbury, Conn., assignor to Castro Convertible Corporation, New Hyde Park, N.Y.

Filed July 11, 1972, Ser. No. 270,665
Int. Cl. B23p 11/02
U.S. Cl. 29—453 11 Claims



A device is disclosed for assembling the head and tab of a tufting button wherein the head has an opening on one side thereof and the tab has an elongated connecting end whose length is greater than the diameter of the button opening. The device, which automatically inserts the tab's connecting end in the hollow button head includes a recessed support block for supporting the button head on the side thereof opposite its opening and an elongated insertion rod operatively associated with the support block for movement between first and second positions with respect thereto. In its first position the insertion rod is located at a point remote from the support block and positioning of the cloth tab's connecting end within the opening. The second position of the rod is selected so that the rod will extend through the opening of a button positioned on the support means at an angle to the plane of the opening. As a result, when the insertion rod is moved from its first to its second position, the rod engages the cloth tab connecting end, which is partially located within the opening of the button on the support block, and urges the connecting end into the opening to complete the tufting button without damage to either the connecting end or to the button itself.

3,789,497

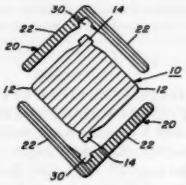
METHOD OF PRODUCING COMPOSITE METAL ARTICLE

Robert H. Snodgrass, Massena, N.Y.; James R. Carter, Bath, Maine, and Carl M. Edstrom, Massena, N.Y., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sept. 29, 1972, Ser. No. 293,486
Int. Cl. B23p 11/02
U.S. Cl. 29—453 20 Claims

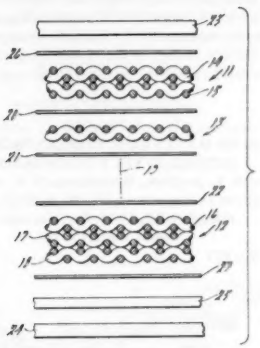
A composite metal body is produced using a metal cladding and metal core with longitudinal dovetail-wedge or diamond

shaped tongue and groove means for interlocking engagement, rolling the assembly to effect interlocking, and further



rolling the assembly to metallurgically bond the cladding to the core.

3,789,498
METHOD OF DIFFUSION BONDING
Frederic W. Cole, Detroit, Mich., assignor to AMBAC Industries, Incorporated, Carls Place, N.Y.
Filed Nov. 1, 1971, Ser. No. 194,231
Int. Cl. B23k *1/20*
U.S. Cl. 29—470.9 **11 Claims**

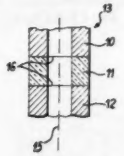


A separator is used in the diffusion bonding of materials such as wire cloth and laminates to prevent unwanted bonding of adjacent surfaces. The separator sheet is formed by the oxidation of metal alloy surfaces either before or during the bonding to form a refractory oxide barrier layer. Iron-chromium-aluminum alloys are especially useful and may be modified by the addition of rare earth metals such as yttrium.

3,789,499
METHOD OF FABRICATION OF A COMPOSITE PRODUCT MADE UP OF AT LEAST TWO COMPONENTS HAVING DIFFERENT COMPOSITIONS
Michel Pequignot, Clamart, France, assignor to Commissariat A L'Energie Atomique and Societe Pour L'Application Des Hautes Temperatures (Quartex), Paris, France
Filed Aug. 3, 1972, Ser. No. 277,529
Claims priority, application France, Aug. 9, 1971, 7129035
Int. Cl. B23k *31/02*
U.S. Cl. 29—472.9 **5 Claims**

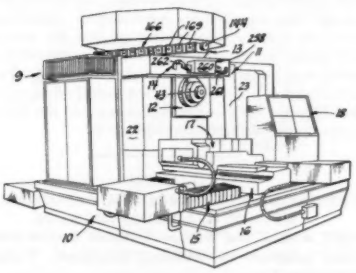
At least two components having different compositions, such as niobium and alumina, and mating contact surfaces are brought together in edgewise relation in order to be diffusion-bonded, the contact surface adopted for each component or the line of extension of said surface being such as to pass through an axis which is common to both components.

Each surface is polished to an optical finish and the components are assembled so that said surfaces are in mating relation with zero clearance. A moderate holding pressure is ap-



plied to the components and these latter undergo a heat treatment at high temperature for a limited period of time and at low pressure in an inert atmosphere or in a vacuum.

3,789,500
MACHINE TOOL WITH AUTOMATIC TOOL CHANGING MEANS
Dale J. Bondie, Fowlerville; Robert S. Sutton, Franklin, and James D. Lewelling, Birmingham, all of Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich.
Filed July 28, 1971, Ser. No. 166,886
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 **13 Claims**



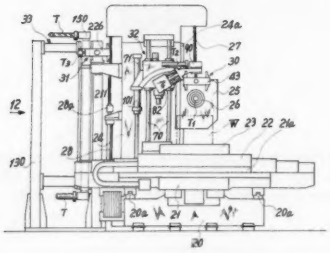
A machine tool having an automatic changing means and which is constructed and arranged to carry out a variety of machining operations, such as milling, drilling, boring, tapping and the like. The machine includes a rotary, four-position index work table which is carried on two movable, perpendicularly disposed slide members to provide movement of the work table along X and Z axes. A tool spindle assembly is slidably mounted on a "Y" axis between two column members with a tool spindle, spindle drive motor, gear box, tachometer and resolver mounted in axial alignment with each other for movement as a unit along said Y axis. A tool storage conveyor is disposed horizontally on said column members above the tool spindle assembly and for moving tools into a tool changing position above the tool spindle. A tool changer means is mounted between the column members and between the tool spindle assembly and the tool storage conveyor for automatically transferring tools directly between the tool storage conveyor and the tool spindle.

3,789,501

MACHINE TOOL WITH TOOL CHANGE DEVICE

Mikishi Kurimoto, Nagoya; Keniti Munekata, Kariya, and Yoji Kamiya, Anjyo, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Nov. 30, 1971, Ser. No. 203,406
Claims priority, application Japan, Dec. 4, 1970, 45/107854
Int. Cl. B23q 3/157
U.S. Cl. 29—568 9 Claims



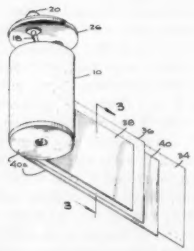
A machine tool is provided with an automatic tool change device for permitting the same to perform a variety of machining operations on a workpiece. The tool change device comprises a tool storage magazine installed on the floor adjacent the machine for removably storing a plurality of diverse tools, a carriage mounted on an upstanding column of the machine and an intermediate transfer device mounted on the carriage and carrying a tool holding device thereon. The carriage follows the movement of a spindle head receiving a spindle therein so that a tool change operation can be effected between the tool holding device and the spindle by a main transfer device immediately following a machining operation. Means are also provided for rendering the following movement of the carriage inoperative so that the intermediate transfer device may be rotated, while being retractable and extendable, in the direction of the tool storage magazine to permit a tool change operation by a sub-transfer device to be performed between the tool holding device and the tool storage magazine during the machining operation.

3,789,502

FUSED CATHODE ELECTROLYTIC CAPACITORS AND METHOD OF MAKING THE SAME

Harold T. Callins, and William H. Doster, both of Greenfield, Tenn., assignors to Whitehall Electronics Corporation, Richardson, Tex.

Filed June 5, 1972, Ser. No. 259,920
Int. Cl. B01j 17/00
U.S. Cl. 29—570 4 Claims



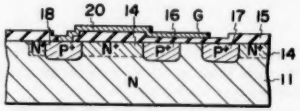
A metallic foil electrolytic capacitor and method of making the same, wherein anode and cathode foils and dielectric sheets are wound into a capacitor cartridge or roll with a lateral edge of the cathode foil protruding in exposed relation at the bottom of the roll beyond the edges of the dielectric sheets and anode foil insulated therebetween, and thermally fusing the protruding exposed cathode foil edges together in a selected pattern spanning the bottom of the roll.

3,789,503

INSULATED GATE TYPE FIELD EFFECT DEVICE AND METHOD OF MAKING THE SAME

Sumio Nishida, and Yasunobu Kosa, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 25, 1971, Ser. No. 156,709
Claims priority, application Japan, June 26, 1970, 45/55148
Int. Cl. B01j 17/00
U.S. Cl. 29—571 9 Claims



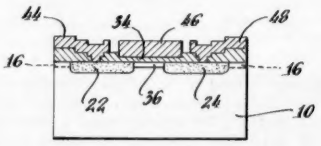
An insulated gate type field effect transistor having a source, a drain and a clamping diode region of P conductivity type formed in an N conductivity type silicon substrate and a low resistivity region of N^+ conductivity type formed in the substrate surface except in the channel region so as to bridge the source region and the clamping diode region.

3,789,504

METHOD OF MANUFACTURING AN N-CHANNEL MOS FIELD-EFFECT TRANSISTOR

Abdulmassih Y. Jaddam, Whitestone, N.Y., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 12, 1971, Ser. No. 188,205
Int. Cl. B01j 17/00
U.S. Cl. 29—571 12 Claims



The process for fabricating an N-channel enhancement type field-effect semiconductor device includes the step of implanting impurity atoms to form a channel region in a high resistivity substrate between the source and drain regions. By utilizing ion implantation, the amount and location of impurities can be accurately controlled. During the subsequent growth of the gate oxide layer, the impurity distribution is changed to provide a semiconductor device having the desired operating characteristics.

3,789,505

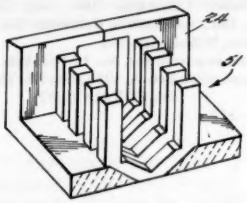
METHOD OF MAKING A MULTI-CORE MAGNETIC HEAD WITH A NON-MAGNETIC HOLDER

Robert L. Huntt, 25007 Woodfield Rd., Damascus, Md.

Filed Feb. 11, 1972, Ser. No. 225,571
Int. Cl. G11b 5/42
U.S. Cl. 29—603 10 Claims

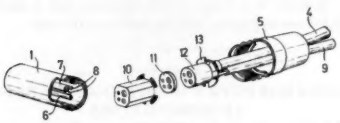
A method of making a multi-core magnetic head whereby a plurality of slots are produced in the base portion of a U-

shaped block of non-magnetic ceramic material, such as Zinc Ferrite. Pieces of magnetic ceramic material, such as Nickel Ferrite, which have been ground to the appropriate shape are each slipped into the slot and bonded therein, for example, by glass bonding, so as to extend into the region bounded by the legs of the block of non-magnetic ceramic material. This region is then filled with a potting material which lends mechanical strength. The pieces and block are then cut in half along a



line which passes through each piece and the surface thus formed on each half gound, lapped and polished to profile the desired pole piece dimensions. If desired the base of the block can then be grooved and shields placed in the grooves to reduce cross-talk. Spacing material is then deposited, for example, Titantium by vacuum deposition, on the non-magnetic block to set the gap thickness. The two ground halves are then bonded together and potted to form the multi-core head.

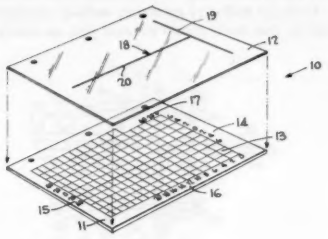
3,789,506
DENTAL HANDPIECES
Richard Bell Johns, Orpington, England, assignor to Vann Brothers Limited, London, England
Filed Dec. 23, 1971, Ser. No. 211,458
Int. Cl. A61c *1/10*
U.S. Cl. 32—27 **3 Claims**



A handpiece for a dental drill comprising a fibre optic light conductor passing along inside the handpiece and emerging towards the operative end thereof the said conductor terminating adjacent the operative end of the handpiece so as to illuminate a drill tip when such is fitted in the handpiece.

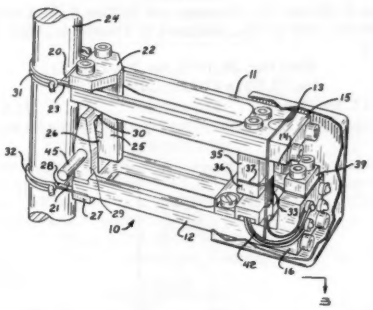
3,789,507
MACHINE ELEMENT ALIGNMENT SYSTEM
Malcolm G. Murray, Jr., 785 Robindale Rd., Brownsville, Tex.
Filed Feb. 17, 1972, Ser. No. 227,525
Int. Cl. G06g *1/00*
U.S. Cl. 33—1 SD **20 Claims**

A graphical method for determining corrections required to align one machine element with another employing a plotting board-overlay combination comprising a grid, said grid comprising scale means whereon is represented machine element spatial orientation and dimensions, and a transparent or semi-transparent form for overlay onto said plotting board whereon is plotted said one machine element spatial orientation and dimensions. The method comprises superposing said form onto said plotting board, plotting machine spatial orientation and dimensions of said one machine element onto said overlay form, repositioning said overlay form to correspond with existing machinery orientation, and reading magnitude and



direction of said required misalignment corrections directly from said plotting board grid.

3,789,508
EXTENSOMETER
Harry R. Meline, Minneapolis, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.
Filed Aug. 18, 1971, Ser. No. 172,828
Int. Cl. G01b *5/00*
U.S. Cl. 33—148 D **11 Claims**

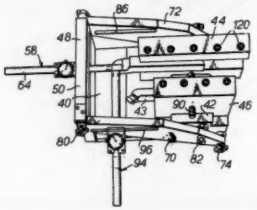


A strain gage extensometer used for measuring and controlling strain in tensile tests, compression tests and fatigue tests on specimens. The extensometer has a pair of arms that are connected together with a flexible element. The arms are coupled to move with the specimen when the specimen is subjected to strain and thus cause a strain in the flexible element supporting the arms. Suitable strain gages are utilized on the flexible element so that the strain in the specimen can be determined. As shown, the arms are also coupled with a cross flexure element to stabilize the arms.

3,789,509
METHOD AND APPARATUS FOR SETTING CUTTING TOOLS IN MACHINE TOOLS
Leslie Harkness, Halifax, England, assignor to Warner Swasey Asquith Limited, Halifax, England
Division of Ser. No. 752,604, Aug. 14, 1968, Pat. No. 3,625,097. This application Sept. 27, 1971, Ser. No. 183,949
Int. Cl. B27g *23/00*
U.S. Cl. 33—185 R **4 Claims**

A machine tool has front and rear cross slides with tool locating means thereon and a turret with a tool locating datum surface thereon. The cutting tools for the machine tool are preset prior to their being mounted on the turret and cross

slides. The tools are preset by using apparatus which includes a first jig operable to preset tools for use on both the front and rear cross slides prior to positioning said tools on said cross slides and a second jig for presetting tools for use on said turret. Both jigs include a reference surface simulating the datum plane so that tools preset on said jigs are easily and quickly



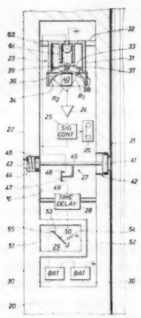
positionable on the machine tool with reference to the datum plane. The apparatus further includes a datum surface transfer arm having a transfer surface adapted to lie on the datum surface, and means for mounting said transfer arm on the turret so that the transfer arm is operable to facilitate positioning the tools on the cross slide.

3,789,510

BOREHOLE DEVIATION MEASUREMENT WHILE DRILLING

Albert P. Richter, Jr., Houston, and William R. McEvers, Jr., Bellaire, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 29, 1971, Ser. No. 213,581
Int. Cl. E21b *47/022*; **G01c** *9/06, 9/20*
U.S. Cl. 33—306 **11 Claims**



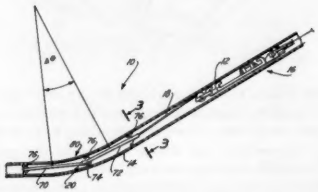
Disclosed is a downhole deviation-sensing system for enclosure in a drilling string during the drilling operation. The system produces a control signal representative of the deviation of a drilling collar of a drilling string relative to a vertical. The system employs a hollow lens enclosure with a concave configuration, the enclosure being partially filled with an opaque, anti-foaming liquid so that a bubble is formed within the lens enclosure, and an area is exposed on a concave inner surface of the enclosure, the area being bounded by an imaginary cylinder at right angles to the inner surface. A collimated light source and a photocell are aligned with the central axis of the imaginary cylinder, with the photocell having a surface area similar in size to the area defined by the cylinder. Dependent upon the degree of tilt with respect to a vertical, the area formed by the bubble on the lens controls the amount of light transmitted to the photocell. The photocell output is calibrated so that it is a function of the angle of deviation. The system is adapted for downhole operation in a drilling string, and series-connected switches for controlling the conditions of operation, i.e., when not drilling, are employed.

3,789,511

APPARATUS FOR SENSING A CURVATURE IN A CONDUIT

Jack J. Groom, Columbus, Ohio, and Gary L. Kinzel, Lafayette, Ind., assignors to Columbia Gas System Service Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 12,961, Feb. 20, 1970. This application Feb. 4, 1972, Ser. No. 223,671
Int. Cl. E21b *47/02*
U.S. Cl. 33—312 **29 Claims**



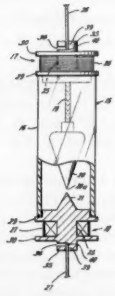
The change in slope of a bore, conduit or pipeline is determined by supporting a pair of pivotally interconnected rigid components in the bore with the ends of the components and the pivotal interconnection therebetween located on the centerline of the bore. The change in slope between the components at the pivotal interconnection therebetween is detected, and this change in slope, because of the manner in which the rigid components are connected, is the same as the change in slope of the bore or pipeline in which the rigid components are placed and is in proportion to the strain in the surrounding pipeline. Apparatus is provided for determining the change of slope in a bore, in this manner, and is particularly adapted for use in pipelines being laid or retrieved.

3,789,512

PLUMB BOB DEVICE WITH SPOOL MEANS FOR TETHERING LINES

Wilfred T. Gros, Rt. 12, Box 565, Houston, Tex.

Filed Feb. 7, 1972, Ser. No. 223,908. The portion of the term of this patent subsequent to Aug. 15, 1989, has been disclaimed.
Int. Cl. G01c *15/10*
U.S. Cl. 33—393 **2 Claims**



A plumb bob device is suspended on a flexible member in a liquid in a closed container. The container is provided with a

centrally positioned, upwardly pointed indicator means for aligning with the plumb bob to indicate a true vertical relationship, and spool means are provided adjacent each end of the container for receiving a flexible line so that the flexible line may be wound on each of the spool means when the plumb bob device is not in use, but may be unwound therefrom to secure the plumb bob device in position for use.

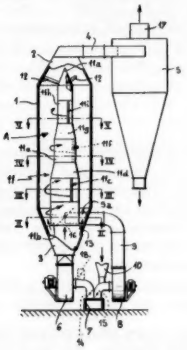
The spools adjacent each end of the container include axially extending shafts with slot means whereby the flexible lines on the spool means may be positioned in the slots to properly position the plumb bob device during use.

3,789,513

PNEUMATIC DRYERS

Andre Mark, 54, cours Lafayette, Lyon, France

Filed Jan. 26, 1973, Ser. No. 326,962
Claims priority, application France, Feb. 4, 1972, 72.04761
Int. Cl. F26b *3/10*
U.S. Cl. 34—10 **11 Claims**



In a pneumatic dryer having a vertical chamber through which the drying gas with the divided material in suspension therein flows upwardly, hot gas streams without divided material are injected tangentially into the chamber alternately in one and the other direction about the axis of the chamber. These streams may issue from a slotted central column. The gas entraining the divided material may be injected tangentially into the bottom of the chamber.

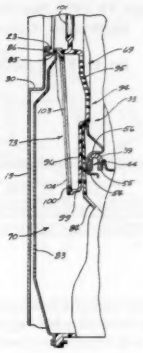
3,789,514

BULKHEAD FILTER ASSEMBLY

Stewart W. Faust, and L. Dean Kuhn, both of Newton, Iowa, assignors to The Maytag Company, Newton, Iowa

Filed July 24, 1972, Ser. No. 274,647
Int. Cl. F26b *21/06*
U.S. Cl. 34—82 **13 Claims**

A removable filter assembly includes a perforate grid portion openly facing the interior of a tumbling chamber and effectively forming a portion of the stationary bulkhead engageable by the tumbling fabrics and further includes a fine mesh filter screen disposed in the path of air being drawn through the tumbling chamber. Lint and other particles removed from the airflow are collected on the fine mesh screen and trapped within the assembly between the perforate portion and the



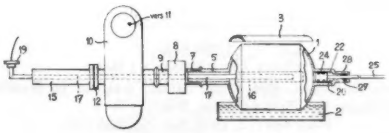
fine mesh screen which are removable from the bulkhead as a unit.

3,789,515

APPARATUS FOR CONDITIONING LYOPHILISED PRODUCTS

Jacques Duprai, Seyssinet, and Henri De Roissart, Grenoble, both of France, assignors to L'Air Liquide Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed Aug. 13, 1971, Ser. No. 171,682
Claims priority, application France, Aug. 18, 1970, 7039335
Int. Cl. F26b *5/06, 13/30*
U.S. Cl. 34—92 **5 Claims**

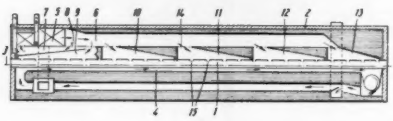


This invention relates to apparatus for conditioning a lyophilised product under atmospheric pressure in an enclosure linked to a pumping unit and lyophilisation is effected under vacuum. The enclosure is associated with means for moving a stopper adapted hermetically to block a neck on the enclosure, and this means is adapted to enable the stopper to move on both sides of the blocked position, viz: to a withdrawal position within the enclosure or to a separation position outside the enclosure in an extension of the neck. The neck includes means for attachment to various accessories in a sealed manner.

3,789,516
CONTINUOUS TUNNEL OVEN FOR BAKING AND/OR DRYING

Horst Schraft, Stuttgart, and Horst Mack, Boblingen, both of Germany, assignors to Firma Werner & Pfeiderer, Stuttgart, Germany

Filed Sept. 19, 1972, Ser. No. 290,373
Claims priority, application Germany, Oct. 8, 1971, 21501928
Int. Cl. F26b *19/00*
U.S. Cl. 34—216 **2 Claims**

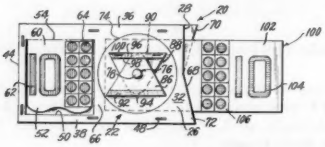


A continuous tunnel oven for baking and/or drying utilizes a baking belt passing through a baking chamber with a nozzle heater arranged in individual zones with the free valve opening area of the nozzles being adjustable.

3,789,517
EDUCATIONAL FLASH CARDS

Catherine J. Romstad, 1776 K St., Menominee, Mich.

Filed Nov. 27, 1972, Ser. No. 309,723
Int. Cl. G09b *1/06*
U.S. Cl. 35—9 E **9 Claims**

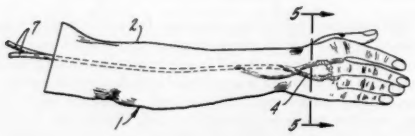


Educational teaching aids in the form of flash cards for visual display of problems and solutions in teachings of mathematics have sleeve like pockets connected together at their sides and at one end. The other end is open to receive a slidable card, and the sleeve has at least one window opening therein. Indicia is inscribed both on the card and on the sleeve, and certain of the indicia can be displayed in the window selectively.

3,789,518
SIMULATED HUMAN LIMB

Myron C. Chase, Red Wing, Minn., assignor to Weatherby/Nasco, Inc., Fort Atkinson, Wis.

Filed Apr. 12, 1972, Ser. No. 243,353
Int. Cl. G09b *23/34*
U.S. Cl. 35—17 **6 Claims**

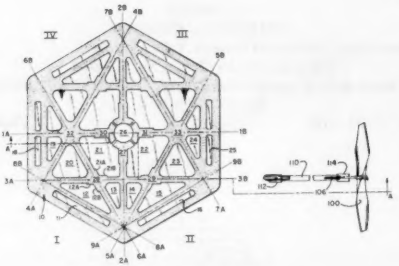


An anatomical part simulacrum wherein a core is enclosed within a skinlike glove and the method of forming the simulacrum by separately forming a core and a glovelike element and thereafter applying the element to the core.

3,789,519
ROTOPLANE PLATFORM ENERGY SOURCE

Marshall A. Montgomery, Pleasant Hill; Herbert D. Thier, Moraga, both of Calif., and John B. Orfei, North Revere, Mass., assignors to American Science & Engineering Inc., Cambridge, Mass.

Filed June 15, 1972, Ser. No. 263,107
Int. Cl. G09b *23/08*
U.S. Cl. 35—19 R **10 Claims**

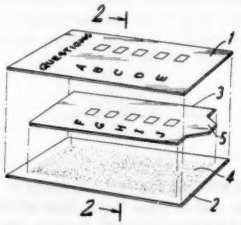


An educational/experimental unit demonstrating principles of mechanical energy storage and conversion comprises a platform base which is rotatable and is driven by at least one propeller supported from the base. The base allows multiple orientations of the propeller and the use of multiple propellers to provide an effective series of experiments for demonstrating the principles involved.

3,789,520
INFORMATION RECORDING DEVICE

Bertram H. Lowi, 135 Amity St., Brooklyn, N.Y.

Filed June 9, 1972, Ser. No. 261,320
Int. Cl. G09b *3/06*
U.S. Cl. 35—48 A **5 Claims**

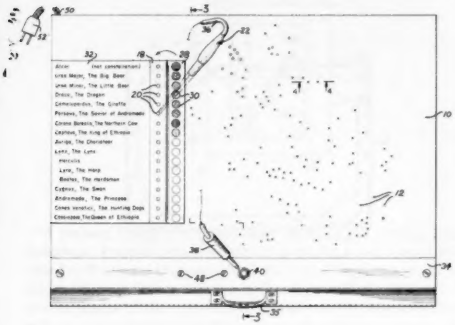


A answer storage device for such purposes as opinion surveying having means for providing two simultaneous records of an answer made by the subject: an overt record made directly by the respondent and visible to him, and a covert record made by a force responsive medium within the form and not visible to the subject or changeable by him.

3,789,521
FIBER OPTIC TEACHING AID DISPLAY

Frederick L. Way, and Donald F. Way, both of Signal Hill Rd., Brookfield, Conn.

Filed Oct. 20, 1972, Ser. No. 299,440
Int. Cl. G09b 27/04
U.S. Cl. 35—43 6 Claims

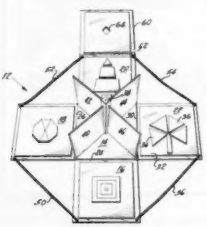


A teaching aid comprises a display surface having a plurality of lighting element locations arranged in predetermined patterns. The ends of a plurality of light-conducting fibers are received in and extend from the lighting element locations on the display surface. The other ends of the light-conducting fibers are received in a support surface which retains the ends in predetermined groupings corresponding to selected patterns on the display surface. A movable pen light is provided for selectively illuminating the various groupings of fiber ends on the support surface, the fibers transmitting the light to illuminate the corresponding patterns on the display surface.

3,789,522
EDUCATIONAL TOY DEVICE

Jaymes D. Moore, 16198 N.E. 8th Ct., North Miami Beach, Fla.

Filed Mar. 19, 1973, Ser. No. 342,870
Int. Cl. A47b 41/00
U.S. Cl. 35—60 9 Claims

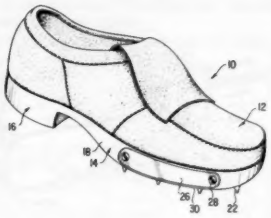


An educational toy device which is a three dimensional unit for storage and includes a base with a plurality of hingedly connected panels at its outer edge adapted to be folded into the plane of the base with each of the panels defining a work station and having sockets to receive items of a predetermined geometrical shape sized to fit the respective sockets of the work stations and wall portions extending outwardly from the central portion of the base to separate the work stations from one another so that a plurality of youngsters may use the toy simultaneously, each working at a separate work station.

3,789,523
GOLF SHOE

Robert M. Rubin, 6545 Rustic Dr., Mesa, Ariz.

Filed Oct. 16, 1972, Ser. No. 297,926
Int. Cl. A43b 13/22
U.S. Cl. 36—2.5 AH 6 Claims

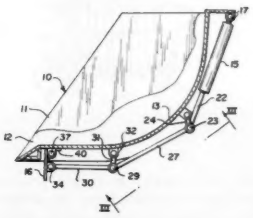


A golf shoe designed to aid a golfer in assuming a proper stance on a golf playing surface so that when addressing the ball the golfer pivots about a more or less stationary vertical line rather than swaying during his swing. The shoe includes a sole attached to an upper. The sole has opposed inner and outer sides, the outer side of said sole extending from the upper to a lower elevation than the inner side to create a toe-in effect when the golfer assumes his stance on a golf playing surface. A metal plate is fixed to the sole along the outer side thereof to preclude undue bending and wear of the sole edge during the pivotal portion of the golfer's swing. A plurality of cleats are attached to the sole and extend along the sole adjacent the outer and inner sides thereof. The cleats adjacent the outer side of the sole are smaller than the cleats adjacent the inner side of the sole by an amount approximately equal to the difference in elevation between the outer and inner sides of the sole so that when the golfer walks on a planar surface, his foot will be substantially level.

3,789,524
PIPE CRADLER ATTACHMENT FOR EXCAVATOR BUCKET

David Mashuda, R.D. No. 1, Evans City, Pa.

Filed Oct. 10, 1972, Ser. No. 295,967
Int. Cl. E02f 3/60
U.S. Cl. 37—118 R 7 Claims



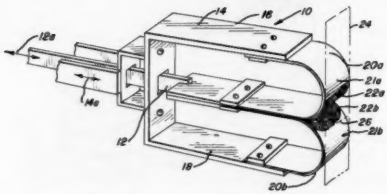
An excavating bucket, such as may be used on a back-hoe for digging a trench. The bucket is provided with a recessed back in which is mounted adjacent the front edge a hinged template. The template is normally swung back into the recess but is optionally swung outward and forward by pressure operated cylinders at the back of the bucket under control of the operator. In its extended position below the front edge of the bucket, the template scoops a cradle or channel in the bottom of the trench for pipe to seat in.

3,789,525

ELECTRO-MECHANICAL DISPLAY DEVICE

Kenly C. Bugg, Fort Wayne, Ind., assignor to Kendick Manufacturing Co., Fort Wayne, Ind.

Filed Nov. 3, 1972, Ser. No. 303,332
Int. Cl. G09f 9/30
U.S. Cl. 40—28 C 6 Claims



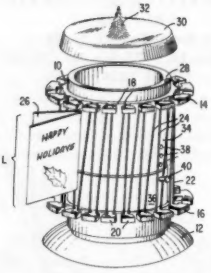
There is disclosed an electro-mechanical display device which is actuated by low level power signals which is particularly adapted to be used in readout devices for digital logic circuitry. The display device comprises two segments of resilient film, a first support, one end portion of each of the segments are supported in contiguous relation to one another by the first support, a second support attached to each of the opposite end portions of this film segment, and a means for imparting a relative movement between the first support and the second support wherein indicia located on each of the film segments is moved into and out of view by the relative movement of the first and second supports.

3,789,526

CARD HOLDER

Barry N. Lavinson, 127 W. Farrell Ave., Trenton, N.J.

Filed Dec. 27, 1971, Ser. No. 212,577
Int. Cl. G09f 1/10
U.S. Cl. 40—124 6 Claims



A greeting card holder is herein provided which may present an upright cylindrical body supported on a base platform. A series of protuberances may be formed on the body for holding a cord in a laced configuration so that segments of the cord extend generally vertically when the cylindrical body is properly mounted on a horizontal surface. The cord may be spaced from the outer surface of the body by means of horizontally extending ledges and the protuberances may be formed on the ledges, if desired.

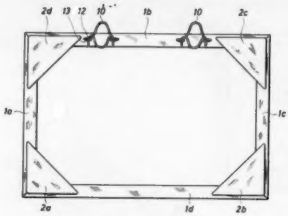
The body may be rotatably mounted on the base to rotate about a vertical axis and the upper portion of the body may be formed to receive a cover which may be decorated to symbolize the occasion for which the displayed greeting cards have been received.

3,789,527

FRAME FOR ART PRINTS

Werner Johan Mohr, Strandladsvej 42, 2300, Kobenhavn S., Denmark

Filed Jan. 21, 1972, Ser. No. 219,763
Int. Cl. G09f 1/12
U.S. Cl. 40—152 1 Claim



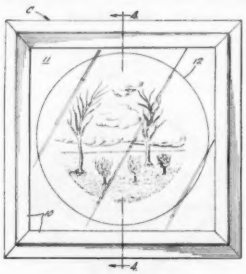
A frame consisting of four frame components, each having U-section, the side walls of said U pressing against each other. The frame components are assembled in pairs by a corner unit having a number of projections, said projections being squeezed into corresponding holes in the side walls of said U. In certain cases the projections are secured by a press-stud effect.

3,789,528

DISPLAY CASE

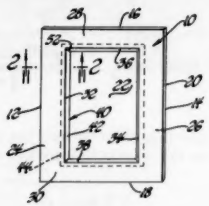
John Knoell, Buckingham, and Eric Siren, Chalfont, both of Pa., assignors to John Knoell & Son, Inc., New Britain, Pa.

Filed May 18, 1972, Ser. No. 254,673
Int. Cl. G09f 1/12
U.S. Cl. 40—152 9 Claims



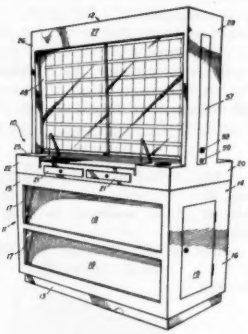
A case for displaying art objects such as plates or the like is constructed in such a manner as to permit the art object to be readily removed for cleaning or handling. The case has a frame in which is mounted a transparent front panel and a removable rear panel spaced therefrom to define a display chamber. A removable one-piece wire form engages in a groove in the frame and has a series of fingers which engage the rear panel at selected locations. The art object is centered in the display chamber by means of a retainer which surrounds the periphery of the object.

3,789,529
PICTURE FRAMING MAT AND EDGE MOLDING
Robert A. Thom, 6160 W. Surrey, Birmingham, Mich.
Filed Sept. 27, 1971, Ser. No. 183,889
Int. Cl. G09f 1/10
U.S. Cl. 40—158 R 2 Claims



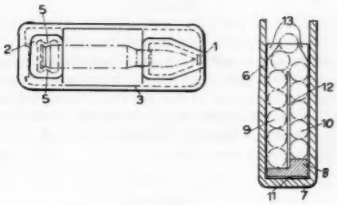
A picture framing mat and edge molding for photographs, paintings, graphic arts, etc. which includes a mat board provided with an opening and which has a molding edge about the edges of the opening that has a shoulder wall of substantially the thickness of the mat board, in order to lie relatively flush with it, and a thin walled flange extending from its underside for adhesive engagement to the underside of the mat board to hold the molding edge in close fitted engagement with the mat edges that frame the opening.

3,789,530
INVENTORY CONTROL APPARATUS
Joe W. Brooks, 1909 Country Club Dr., P.O. Box 1266; Delma C. Waters, East Hiway 44, Drive A.W., both of Eustis, Fla., and Paul J. Ciener, 1560 S. Clayton St., Mount Dora, Fla.
Filed Aug. 7, 1972, Ser. No. 278,537
Int. Cl. G09f 7/02
U.S. Cl. 40—124 5 Claims



An inventory control apparatus for an automobile dealer including a housing, a display area on the housing, a means of releasably displaying in assembled relationship within the display area a plurality of cards having information thereon relative to each automobile in the dealer's inventory and a means slidably received in the housing for releasably maintaining keys to the ignitions of each automobile in relative alignment with each respective card. The displaying means comprises a support surface, a resilient covering on the surface, support members transversely disposed on the covering in spaced, parallel relationship and spacer means arranged in spaced, parallel relationship on the covering in perpendicular alignment with the support members. A transparent covering over the display area provides a surface onto which, over each card, removable labels may be placed which contain information relative to the current status of the automobile listed on the particular card.

3,789,531
METHODS AND DEVICES FOR PACKING AND LOADING AMMUNITION
George Paul Franz Kersten, 179, Ridge St., Muckleneuk, Pretoria, Republic of South Africa
Filed Mar. 13, 1972, Ser. No. 233,880
Int. Cl. F41c 25/02
U.S. Cl. 42—87 5 Claims

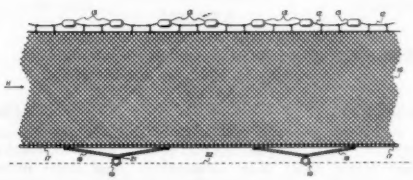


An ammunition container, in particular for small arms, such as rifles, sub-machine guns and machine guns is provided which combines features adapted for protective packaging and for loading the ammunition into magazines or the like. The container is usually made of plastics and is disposable. It eliminates special loading funnels for weapons which required such loading funnels for loading the magazines.

Some embodiments are waterproofed by a plastics foil. Those embodiments which are designed for transferring the ammunition from the package into a magazine comprise formations which either fit around the outside or into the inside of the magazine for proper alignment. Luminous indicating means may be provided to facilitate loading in the dark. The containers can be made so that they will float on water.

The invention improves the firing power of troops, reduces the weight per round of ammunition to be carried by troops, and saves costs.

3,789,532
PURSE SEINE CABLE RING
Emery J. Ferguson, 3654 Kingsley, San Diego, Calif.
Filed Dec. 15, 1972, Ser. No. 315,625
Int. Cl. A01k 73/12
U.S. Cl. 43—14 1 Claim

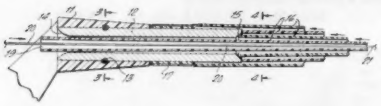


A purse seine cable ring of the type utilized with purse seine nets for anchoring and guiding a draw cable in which the rings have recesses or corners on the inner surface thereof to form a plurality of natural orientation points for minimizing the tendency of the prior art cable rings to orient in one position thereby encouraging excessive wear along one specific area of the ring due to the friction of the draw cable thereon.

3,789,533
FISHING LINE THREADING MEANS FOR TELESCOPIC RODS

Albert L. Bowerfind, East Paterson, N.J., and Zvi Aviezer, New York, N.Y., assignors to Daggeem, Inc., New York, N.Y.

Filed Sept. 8, 1971, Ser. No. 178,759
Int. Cl. A01k *87/00*
U.S. Cl. 43—18 R **3 Claims**

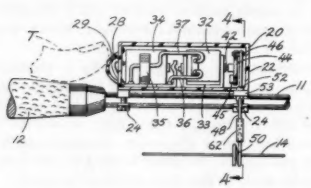


A sectional tubular telescopic rod for fishing or other uses has its innermost section of smallest diameter sufficiently long or lengthened so that when the telescopic sections are fully collapsed, the inner end of the innermost section lies close to the point where the fishing line is fed from a reel thus making it readily possible to thread a fishing line through a tubular rod in a simple and effective manner.

3,789,534
ELECTRICAL ATTACHMENT FOR A FISHING ROD

Thomas J. Yankaitis, 1223 Harlem Blvd., Rockford, Ill.

Filed Feb. 16, 1973, Ser. No. 333,197
Int. Cl. A01k *87/00*
U.S. Cl. 43—19.2 **10 Claims**



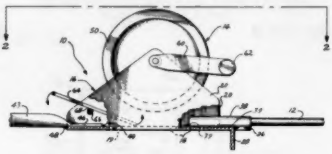
A DC motor is mounted on a fishing rod for selectively driving a reciprocating arm which operates in a plane perpendicular to the fishline. The motor and a battery are contained in a housing which is clamped onto the fishing rod at a point adjacent the handle so that a switch can be easily manipulated by the handle-gripping hand of the fisherman. The reciprocating arm passes through a pivotally mounted connecting block which allows the arm to reciprocate therethrough. The reciprocating arm terminates in an eye circumjacent the fishline and this eye is moved in an ovoid path to vibrate the fishline.

3,789,535
FISHING POLE AND REEL ASSEMBLY

William E. Esplin, 15445 Labrador St., Sepulveda, Calif.

Filed May 24, 1972, Ser. No. 256,305
Int. Cl. A01k *87/06, 89/02*
U.S. Cl. 43—22 **8 Claims**

A fishing pole and reel assembly includes an elongated tapered fishing pole having a butt end and a tip end, a reel support frame made from substantially rigid sheet material shaped to form a flat central base having a pair of laterally spaced apart flat side plates extending upwardly from opposite sides of the base, and a spool carrying a fishing line and secured to an axle rotatably mounted in bearings between the side plates. Separate crank arms, for use in turning the spool, are rigidly secured to the ends of the axle adjacent the outer edges of the side plates, and extend in opposite directions from the axis of the axle. The butt end of the fishing pole is secured to the front of the base, and a handle is secured to the rear of the base. The front edge of the base has a pair of angle tabs projecting downwardly to be fitted over the railing or a boat to support the reel frame. A thumb-operated fishing line

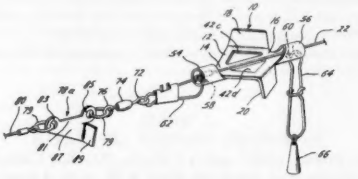


brake arm is pivotally mounted between the side plates to engage the line on the spool to slow the line release rate.

3,789,536
ACTIVATOR FOR FISHING LURES

Joseph Parmeson, 4821 Linden, Bellaire, Tex.

Filed Mar. 27, 1972, Ser. No. 238,106
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.05 **9 Claims**

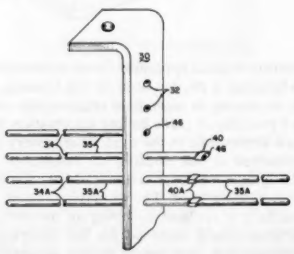


An activator to be utilized by fishermen to give lifelike action to fishing lures as they are moved through the water. The activator is freely movable along a leader that is fastened at one end to a swivel and at the other end to a clasp. The activator automatically meshes with the clasp connection of the leader and is comprised of a flat plate, a turning blade assembly formed of or secured to the flat plate, and a leader guide means at at least one end of the plate to receive the leader. In a tackle combination, the swivel is secured not only to the leader but also to a stabilizer which in turn is fastened to a fishing line to prevent twisting of the line.

3,789,537
MULTIPLE ROD ELECTRODES

Clinton Rule, Beverly Farms, and Peter Adrian Rubel, Concord, both of Mass., assignors to Rule Industries, Inc., Gloucester, Mass.

Filed Nov. 22, 1971, Ser. No. 200,677
Int. Cl. A01m *1/22*
U.S. Cl. 43—112 **8 Claims**



Fabrication of the multiple rod electrode involves a particular deformation of a portion of each electrode rod. The

deformed portions of the electrode rods are then press fitted into receiving apertures provided therefor in a bus bar.

3,789,538

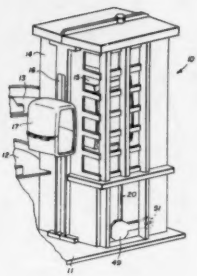
ELEVATOR FOR TOY PARKING GARAGE

Duane E. Spengler, and Charles O. Bartoo, both of West Falk, N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 119,654, March 1, 1971, abandoned. This application Aug. 9, 1972, Ser. No. 278,945

Int. Cl. A63h *33/00*

U.S. Cl. 46—12 **11 Claims**



A vehicle elevator for a toy parking garage includes a vertically movable car guided in a shaft, and an endless drive means for moving the car up and down in the shaft. A hand crank is rotatable in either direction for moving the endless drive means, and a coupling arm is pivotally coupled to the car and to the endless drive means to follow the full course of the endless drive means so that rotation of the hand crank in either direction can move the car either up or down. The toy also includes a bell, stop signs raised by the vehicle car, a simulated passenger car, and a vehicle car floor that tilts to roll a vehicle out of the car.

3,789,539

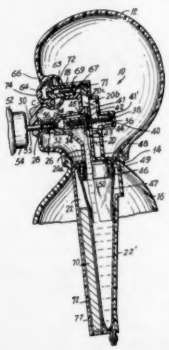
DOLL TEARING MECHANISM

George Cagen, Brooklyn, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed Dec. 22, 1971, Ser. No. 211,029. The portion of the term of this patent subsequent to Sept. 12, 1990, has been disclaimed.

Int. Cl. A63h *13/02*

U.S. Cl. 46—135 A **18 Claims**



A weeping doll, having a head with eye sockets and an open mouth formed therein, is provided with a gravity influenced weeping device for causing the doll to weep when placed in a generally horizontal position. The weeping device includes a liquid inlet tube located adjacent the open mouth and a flexible reservoir tank in liquid communication with the inlet tube. A selectively operable valve is located in the inlet tube for opening the inlet to permit liquid to flow through the mouth to the reservoir. The inlet tube is provided by a rigid housing which defines a liquid flow conduit between the flexible reservoir and the eye sockets of the doll and means is provided for compressing the flexible reservoir when the doll is in a generally horizontal position to force liquid from the reservoir through the conduit to the eye sockets, in order to simulate weeping or tearing.

3,789,540

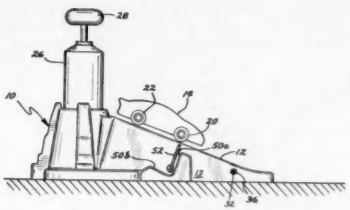
COMPRESSED AIR PROPELLED TOY VEHICLE AND LAUNCHING SYSTEM

Frank J. Convertine, and Charles G. Ganance, both of Cincinnati, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.

Filed Feb. 20, 1973, Ser. No. 333,924

Int. Cl. A63h *29/16*

U.S. Cl. 46—202 **5 Claims**



A toy vehicle is provided with a motor. The motor has a turbine which is operated by compressed air. The motor is connected through a gear train to the driving wheel of the vehicle. A launching structure having an air pump, an air hose for connecting the air pump to the vehicle motor, and a latching system to hold the vehicle in place while air from the pump is directed at the turbine, and to release the vehicle when it is ready to go.

3,789,541

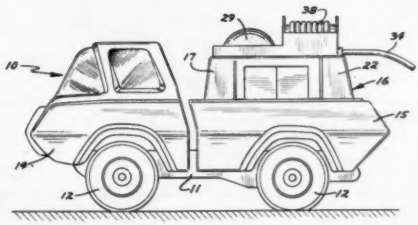
TOY VEHICLE PUMPER

Thomas W. Good, Excelsior, and Theodore H. Zbikowski, Plymouth, both of Minn., assignors to Tonka Corporation, Minneapolis, Minn.

Filed Dec. 4, 1972, Ser. No. 311,916

Int. Cl. A63h *17/08*

U.S. Cl. 46—215 **4 Claims**



A miniature toy vehicle having a tank for holding a quantity of water and a hose leading from the tank and a pumping device for pumping the water from the tank through the hose.

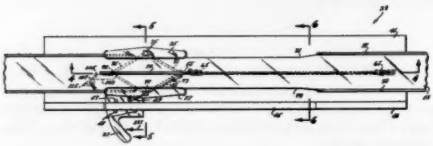
3,789,542

MECHANICAL ACCELERATOR FOR A VEHICLE TOY

Anson Sims, Redondo Beach, Calif.; Edwin O. Stastny, Hong Kong, British Crown Colony, Hong Kong, and Janos Beny, Manhattan Beach, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Division of Ser. No. 752,232, Aug. 13, 1968, Pat. No. 3,641,704. This application Jan. 11, 1971, Ser. No. 105,197

Int. Cl. A63h *33/00*

U.S. Cl. 46—1 K **5 Claims**

An action toy wherein the sides of small unpowered toy vehicles traveling along a track or roadway are engaged by a pair of gripping members disposed adjacent opposite sides of the roadway and wherein the toy vehicles are accelerated by the rectilinear movement of the gripping members before being released by these members.

3,789,543

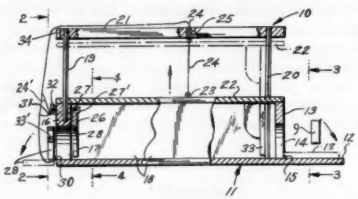
TOY AUTOMOBILE SPEED TRAP DEVICE

Russell F. Kirby, 295 Centre Ave., Abington, Mass.

Filed Apr. 26, 1972, Ser. No. 247,589

Int. Cl. A63h *33/00*

U.S. Cl. 46—1 R **8 Claims**



A toy trap device for toy cars consists primarily of a hollow box like affair to which toy automobiles may be propelled. The device includes a ramp adjacent to a door with a pair of archways for the entrance of the cars and at the opposite end is a swing type door which is struck by a car passing through, will trigger to trap doors.

3,789,544

DOLL HAVING COLLAPSIBLE TORSO AND MEANS FOR CLOSING DOLL'S EYES UPON TILTING

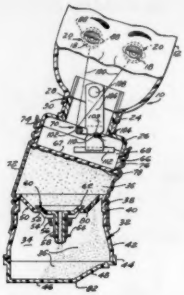
Herbert Thorn, Jamaica, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed May 30, 1972, Ser. No. 257,567

Int. Cl. A63h *29/12, 3/40*

U.S. Cl. 46—41 **15 Claims**

A toy doll adapted to simulate the motions of a child falling asleep has a head and a torso which includes upper and lower portions; the upper torso portion being formed of a flexible material and adapted to collapse relative to the lower torso portion. Fluent material is contained within the torso which is constructed to permit passage of this material between its upper and lower portions. When the fluent material is in the upper torso portion the doll is supported in an erect configuration and as the fluent material flows into the lower torso portion, the upper torso portion collapses, causing the doll to simulate the action of a child going to sleep. Simulated eye units are mounted in eye sockets formed in the doll's head and include rotatable eye members which are adapted to move between opened and closed positions. The eye members are separately controlled by means which selectively moves them towards their closed positions in response to collapse of the torso and by means which moves them towards their closed positions, independently of the collapse of the torso, when the doll is moved towards an inclined or generally horizontal position.



3,789,545

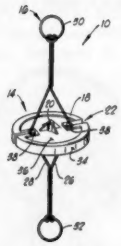
TOY TOP AND RELEASE MEANS THEREFOR

Frederick W. Mann, P.O. Box 444, Waterville, Kans.

Continuation-in-part of Ser. No. 158,246, June 30, 1971, abandoned. This application Dec. 6, 1972, Ser. No. 312,565

Int. Cl. A63h *1/32*

U.S. Cl. 46—62 **4 Claims**



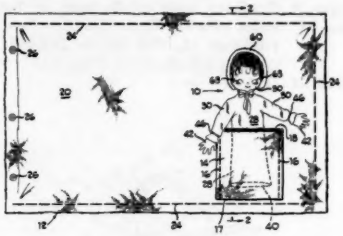
A toy top has a body with spinning points extending oppositely therefrom. Opposed slotted apertures in the body open to the outer surface. Release apparatus has a pair of cords with members secured to their mid portions that are removably engagable with the slots. The release apparatus supports in use the top in spinning by twisting the cords in an opposite winding and unwinding action, and releases the top in spinning when the cords are unwound.

3,789,546

PILLOW WITH HAND PUPPET RECEIVABLE IN A POCKET THEREOF AND MANIPULABLE WHILE THEREIN

Howard J. Morrison, Deerfield, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Apr. 28, 1972, Ser. No. 248,429
Int. Cl. A63h 3/14
U.S. Cl. 46—116 4 Claims



A doll and pillow combination wherein a baby doll is removably received on one side of the pillow in a pocket secured to a pillow case. The body portion of the doll is hollow so that a child may place a hand inside the doll and manipulate the same in a manner as a puppet.

3,789,547

MANUFACTURING PROCESS FOR DOLLS, PUPPETS, PLUSH ANIMALS, CONSISTING IN THE USE OF TWO FABRICS ADHERENT ONE TO THE OTHER

Maurice Roger Francois Chemarin, 83, Rue de Maubeuge, Paris, France

Continuation of Ser. No. 883,878, Dec. 10, 1969, abandoned. This application Mar. 16, 1972, Ser. No. 235,428
Int. Cl. A63h 3/02
U.S. Cl. 46—158 3 Claims

Improved construction for children's toys such as dolls, animals and the like incorporating selectively located gripping areas on the surface of displaceable body elements thereof that are releasably engageable with grip receptor surfaces on the body portion thereof to permit selective body element displacement and releasable maintenance of displaced positioning thereof.

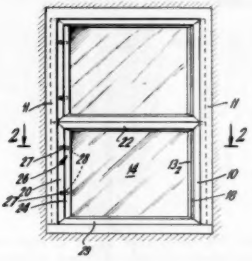
3,789,548

WINDOW ARRANGEMENT

Fred M. Campisano, 136 Jefferson Ct., Yorktown Heights, N.Y.

Continuation-in-part of Ser. No. 882,231, Dec. 4, 1969, abandoned. This application Mar. 30, 1972, Ser. No. 239,648
Int. Cl. E06b 7/16
U.S. Cl. 49—162 5 Claims

An improved window arrangement employs one or more window sashes for sliding vertically within an associated, dedicated track of a window frame. The glass in each window sash is rotatably secured to the sash peripheral mechanical members. The glass and its attendant supporting assembly may be rotated into the enclosure containing the window to provide ready, convenient and safe access to the glass for maintenance or other purposes. The composite window includes hinge, latch and like appurtenances for preferred operation.

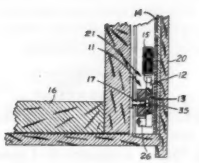


3,789,549

ROTATABLE LOCKING SUPPORTS FOR SASHES OF WINDOWS

James K. Yip, Rock Island, Ill., assignor to Rodman Industries, Inc., St. Paul, Minn.

Filed May 30, 1972, Ser. No. 258,053
Int. Cl. E05d 13/10
U.S. Cl. 49—181 4 Claims



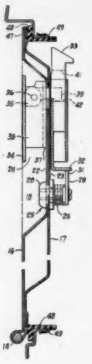
A sliding, window-supporting assembly has a rotary locking member in a sliding, supporting block contained within a channel of each vertical weather strip. The circumferential surface of the rotary locking member has diametrical portions like a cylinder and alternate cutoff portions. The diameter of the locking member between the cylindrical portions is somewhat greater than the normal width between those sides of the channel that are perpendicular to the jamb of the window, and when the sash that is keyed to the rotary locking member is rotated to a horizontal position, the cylindrical edges press against the sides of the channel to deform small portions of the sides to hold the sliding, supporting assembly stationary. While the sash is vertical, the cutoff portions of the rotary locking member are adjacent the respective sides of the channel, and the sliding supporting block is free to slide for raising or lowering the sash. A flat spring with a screw adjustment cooperates with a pair of strips along respective sides of the sliding, supporting block to provide a controlled amount of constant friction.

3,789,550

CORROSION-RESISTANT, DOUBLE-PANEL, LOCKABLE DOOR

Robert C. Seiwert, Wooster, Ohio, assignor to Stahl Metal Products Division, Cleveland, Ohio

Filed June 12, 1972, Ser. No. 261,912
Int. Cl. E06b 3/00
U.S. Cl. 49—503 4 Claims



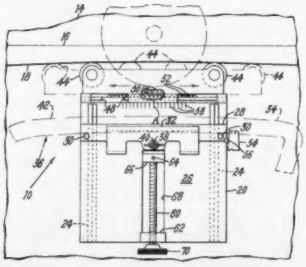
A corrosion-resistant, double-panel, lockable door for automotive utility bodies is provided in which the portion of the panels for receiving a lock and paddle latch mechanism is formed into a drawn recess so that this portion of the panels is integral with the remainder of the panel. Consequently, no seams or openings, which would tend to receive water or moisture, are necessary in order to mount the latch handle and lock assembly on the door without protruding parts. The lock extends through the sheet material forming the panels, and the parts forming the paddle handle and latch mechanism are secured to the sheet material on either side thereof by rivets extending through the material. Nevertheless, the arrangement is such that the lock opening may be sealed, and a slot, provided to permit the paddle handle mechanism to engage the latch, is protected from exposure to the weather to guard against entry of moisture into the space between the panels, thus preventing accumulation of water between the panels and eliminating the cause of rust or corrosion.

3,789,551

SKATE SHARPENING DEVICES

John F. Norris, Braintree, and Donald R. Humphreys, Topsfield, both of Mass., assignors to Custom Radius Corp., Topsfield, Mass.

Filed Feb. 28, 1972, Ser. No. 229,700
Int. Cl. B24b 1/00, 9/04
U.S. Cl. 51—92 R 8 Claims



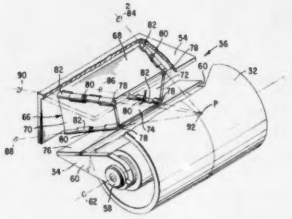
A device to establish and control the desired longitudinal contour of an ice skating blade during sharpening thereof. Included is a skate blade holder which is mounted for movement on a carriage such that the holder follows an arcuate template as it is moved past a rotary grinder. An indexing mechanism is provided for adjusting the position of the skate blade on the holder such that a predetermined ice tangency point may be established on the blade.

3,789,552

TRACKING MECHANISM FOR BELT SANDERS

Douglas W. Bradbury, and Cecil O. Huey, Jr., both of Clemson, S.C., assignors to The Singer Company, New York, N.Y.

Filed Sept. 12, 1972, Ser. No. 288,456
Int. Cl. B24b 21/18; F16h 7/18
U.S. Cl. 51—135 BT 9 Claims



A tracking mechanism for centering a sanding belt of a belt sander, wherein a linkage means is connected to the frame of the sander. The linkage means carries a mounting bracket to which an idler pulley is rotatively connected. The linkage means has a plurality of links pivotally interconnected to each other to form a frusto-polyhedron whose vertex defines a pivot point disposed forwardly of the idler pulley, so that when unbalanced forces act on one side of the idler pulley, the linkage means will be caused to rotate about the pivot point to produce a turning movement thereabout, and cause the opposite side of the idler pulley to counteract the initial forces by shifting and restoring the idler pulley to a balanced position. The pivot center line intersects a plane passing through the center line of the sanding belt, which plane is substantially perpendicular to the axis of the pulley. This location of the pivot point also will serve to aid tracking of, and limit runoff of the sanding belt from the pulley.

3,789,553

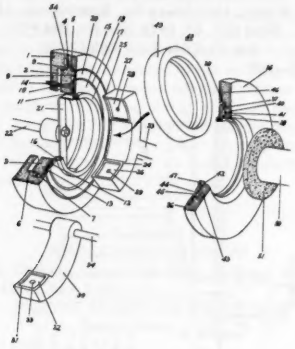
DEVICE FOR HOLDING A RING-FORMED WORKPIECE INTENDED TO BE MACHINED ON ITS INNER ENVELOPE SURFACE

Erik Lennart Waldemar Johansson, Gotabergsgatan 34, Goteborg, Sweden

Filed June 15, 1971, Ser. No. 153,387
Int. Cl. B24b 41/04
U.S. Cl. 51—237 R 4 Claims

Device for holding a ring-formed workpiece with an inner and outer envelope surface and with transversal end surfaces which particularly are flat, which workpiece which for instance can consist of a ball race or any other conventional type of ring, when set up is to be subjected to machinging such as grinding or polishing and the like of the inner envelope surface, characterized by two holding members for holding the workpiece axially, each of which with one of its sides acts upon a transversal surface each and has one side provided with a circular surface, each of which surfaces are in contact with its opposite surface via a pressure-medium cushion or film for securing of the workpiece., one of the holding members then being capable of being driven, and by a number of transversal clamping jaws, which jaws are arranged at a distance from each other and can be put into contact with the

outer envelope surface of the workpiece via a pressure-medium cushion or film whereby pressure medium cushions limit



movements of the ring-formed workpiece axially in both directions as well as transversely in all directions.

3,789,554

ROTARY GUARD FOR SURFACE TREATING MACHINES

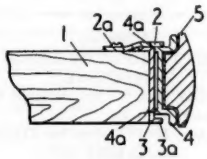
John Lyndon Robbins, London, and Samuel Douglas Bridge, Marlborough, both of England, assignors to R. G. Dixon & Company Limited, Wembley, England

Filed Mar. 28, 1972, Ser. No. 238,796

Claims priority, application Great Britain, Mar. 29, 1971, 8,096/71; June 28, 1971, 30,210/71; July 20, 1971, 33,909/71

Int. Cl. B24b *55/04*

U.S. Cl. 51—274 **3 Claims**



According to the invention, there is provided, in or for a surface treating machine, such as a floor polisher or a hand-held sander, a shield for preventing damage to obstructions adjacent the surface being treated. This shield may consist of a ring of soft material mounted for relative rotation on a rotatable attachment so as to remain stationary if the rotating attachment encounters an obstruction.

3,789,555

SANDING ARTICLE

John R. Means, 5424 Brook Farm Pl., Fort Wayne, Ind.

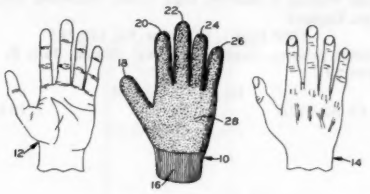
Filed Jan. 25, 1971, Ser. No. 109,150

Int. Cl. B24d *15/04*

U.S. Cl. 51—391 **3 Claims**

A glove, which may consist of paper, cotton twill or the like, is first impregnated with an adhesive taken from the epoxy resin class and an abrasive is then coated over the adhesive lamination on each of the opposite sides of the glove including the digital, palm and back side sections. The glove is configured so that it can be worn on both the right and left hands making the palm and digital sections reversible. Thus, all portions of the glove contain working surfaces. Opposite sides of the glove can be coated with different grades and density of abrasive so that one side of the glove can serve as coarse and the other as fine finishing. either side can be brought into use by simply reversing the glove from one hand to the other, to present the proper working surface.

The abrasive can be applied by means of a cut-out form applied onto a pressure-sensitive surface of the glove; or the



abrasive can be applied to an unpolymerized lamination of plastic material which is soaked into the surface of the glove; or the abrasive surface can form a part of a liner which is slipped over the glove.

The glove may either be dipped into the binder and the abrasive applied by spray coating or passing an impregnated glove through a suspension of particles.

3,789,556

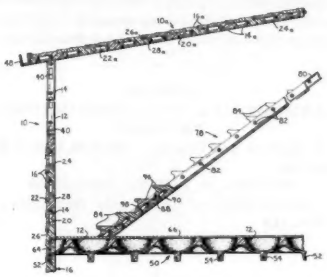
INTERLOCKING STRUCTURAL UNITS

Jerald Paul Skinner, 220 W. 33rd St., Topeka, Kans.

Filed July 13, 1971, Ser. No. 162,219

Int. Cl. E04b *7/12;* **E04f** *11/00*

U.S. Cl. 52—93 **29 Claims**



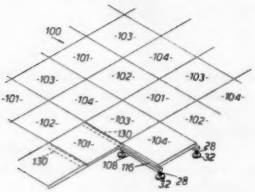
A structural assembly is formed by a frame having a pair of spaced, parallel support components spanned by a series of spaced, parallel members orthogonal to said components, and a series of elongated structural units each longitudinally slotted to receive a corresponding member for support thereby. The frame would normally be positioned with the support components either upright for a wall or inclined for a roof or stairway, with the series of members being horizontally disposed. The structural units are successively installed on the members, each unit as it is installed interlocking with the previously installed unit to lock the series of units together in a rigid assembly. The interlocking units are monolithic bodies of structurally strong, rigid, synthetic resin foam material such as polyurethane, and thus possess superior insulating properties as well as being quite strong in compression. In constructing walls and roofs, panels of assembled frames and units are arranged in abutting, side-by-side relationship to form a multiple-panel wall or roof area. Several mechanical raceways are available and extend throughout the entire area. The individual interlocking units are molded panel sections having

opposed, prefinished surfaces that become the interior and exterior of the structure. For stairway construction, a single frame is employed with the interlocking units thereon being shaped to provide treads and risers.

3,789,557
RAISED FLOORING

Ronald William S. Harvey, High Acres, Rollswood Rd., Welwyn, England

Filed June 1, 1971, Ser. No. 148,713
Claims priority, application Great Britain, June 8, 1970, 27,700/70
Int. Cl. E04f *13/08*
U.S. Cl. 52—126 **19 Claims**

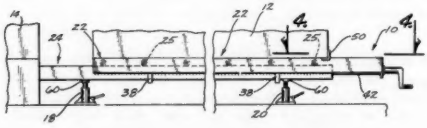


This invention relates to raised flooring made of a number of flooring panels assembled side by side and to the flooring panels themselves. In the raised flooring according to the invention at least some of the panels are supported on their underfaces by spaced substantially parallel battens, one or more of which have parts which project beyond at least one of the edges of these panels. The battens themselves are supported at these projecting parts on props which are adjustable for length so supporting the panels above the actual floor of the building. The invention also extends to these panels themselves.

3,789,558
TRAILER HOME JACK AND METHOD OF OPERATING THE SAME

Herbert E. Spencer, and Tommy S. Mitchell, both of Rt. 4, Hot Springs, Ark.

Filed Nov. 26, 1971, Ser. No. 202,090
Int. Cl. E04h *1/12*; **E04g** *1/24*; **B65g** *7/02*
U.S. Cl. 52—143 **3 Claims**

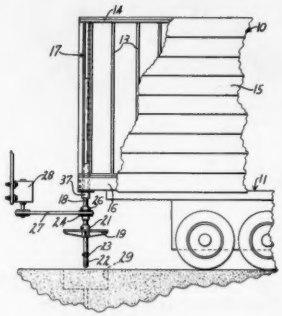


A trailer home is moved into side by side contiguous relationship with another trailer home by placing two pairs of telescopically extendable members transversely under the first trailer home. A pair of vertically disposed ground engaging jacks engage the lower member of each pair of telescoping members and the top member engages the bottom of the first trailer home. A horizontally disposed jack connected between each of the telescoping members allows the first trailer home to be moved toward the second trailer home after the vertical jacks have been operated to raise the trailer home such that the transport wheels are out of ground engagement. A stationary support is then placed under the first trailer home and the jack structure is lowered and removed.

3,789,559
PROCESS AND APPARATUS FOR CONSTRUCTING FOUNDATIONS AND SETTING PREFABRICATED BUILDINGS THEREON

William O. Kirkes, 1052 Sharp Dr., Birmingham, Ala.

Filed Nov. 17, 1971, Ser. No. 199,577
Int. Cl. E04c *3/00*; **E02d** *27/00*
U.S. Cl. 52—169 **4 Claims**

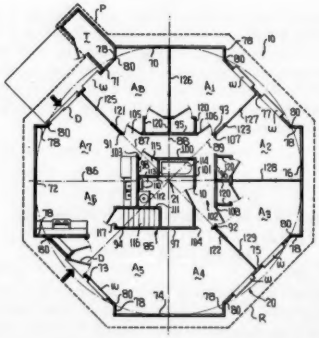


A prefabricated building is provided with a plurality of vertically extending guides located about its periphery. In each of the guides is a rotatable and vertically movable column. The building is carried to the site and while still on the transport vehicle an earth auger is attached to the support members, power is applied and foundation holes are drilled under each of the vertical guides. The auger is removed and permanent load supporting members are installed on the lower ends of the columns, the building is slightly raised, the vehicle removed, and the building is lowered down onto collars which are made fast to the columns, thus supporting the building. The foundation holes are then filled with cement.

3,789,560
SQUARE CIRCLE HOUSE OR LIKE BUILDING STRUCTURE

Robert F. Wood, Oak Hill, W. Va., assignor to Round-Eight Corporation, Oak Hill, W. Va.

Filed Aug. 20, 1971, Ser. No. 173,526
Int. Cl. E04h *1/00*
U.S. Cl. 52—236 **6 Claims**



This disclosure relates to a house or like building structure in which the unique feature dictating the very foundation of the entire system is the geometrical pattern of a structural

load-bearing shell which within a basic 40 foot diameter circle includes a central square cover, the square core being in direct relation to and parallel with walls of the perimeter forming tangents to the common 40 foot circle whereby the center square core now becomes, structurally speaking, the recipient box for load-carrying needed to support all members extending outward to the tangent walls which additionally results in the formation of a floor composed of five rectangular areas. A chordal wall is disposed between adjacent pairs of tangential walls thus resulting in the "squaring" of the 40 foot diameter circle and permitting the construction of the building of a limited number of different size pieces of lumber (only 2 × 4 × 16 and 2 × 6 × 12 required) in an extremely short period of time by unskilled labor, and at a low cost.

3,789,561

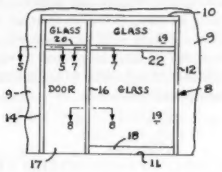
KNOCKDOWN FRAMING

Michael B. Herbert, Cincinnati, Ohio, assignor to American Standard Inc., New York, N.Y.

Filed Feb. 14, 1972, Ser. No. 226,086

Int. Cl. E04c *2/38*

U.S. Cl. 52—456 **3 Claims**



Improved knockdown framing for erection and installation in an access opening of a building for supporting one or more movable panels and one or more fixed panels. The various knockdowned frame elements (such as the header, jamb members, mullions and sill members) are packaged into a compact shipping bundle or package; at the job site the various frame elements are connected together by special connectors which are concealed during the process of erecting and installing the frame. The installed frame thus has the same appearances as a welded frame.

3,789,562

BUILDING STRUCTURE

Antoni De Chicchis; Harry C. Fennell, Jr., and David M. Schwartz, all of Pittsburgh, Pa., assignors to ARK-Environmental Research, Inc., Pittsburgh, Pa.

Filed Aug. 10, 1972, Ser. No. 279,635

Int. Cl. E04h *12/10*

U.S. Cl. 52—648 **2 Claims**

A building structure with a plurality of strut members forming a geometric configuration having a plurality of vertices. A joint member joins the strut members at each of the vertices and a plurality of panel members bridge the strut members. Each of the panels is connected at its edge to a strut member under spring-like action providing frictional engagement with the strut member.

3,789,563

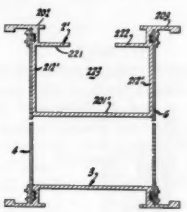
STRUCTURAL UNIT

Andrew J. Toti, 311 W. River Rd., Modesto, Calif.

Division of Ser. No. 888,717, Dec. 29, 1969. This application Sept. 9, 1971, Ser. No. 179,220

Int. Cl. E04c *3/07*

U.S. Cl. 52—731 **12 Claims**



A structural beam comprised of a pair of opposed metal extrusions having preformed slot structures extending therealong in which edge portions of a pair of opposed sheet metal side wall members are secured by deforming certain of such members relative to the others so that secure interconnection is effected without requiring separate fasteners. The assembly machine and method disclosed employ predetermined lengths of the metal extrusions which are joined with substantially continuous lengths of sheet metal side wall panels into a unitary assembly which is subsequently cut to a predetermined length determined generally in accordance with the length of the extrusions employed.

3,789,564

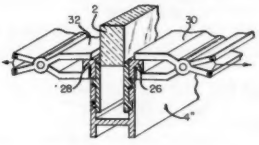
UNITARY RIGID EDGE CHANNEL FOR WINDOWS

Gerald Kessler, 388 Cranberry Rd., Boardman, Ohio

Filed Jan. 18, 1972, Ser. No. 218,754

Int. Cl. E04b *1/62*; **E06b** *3/62*

U.S. Cl. 52—127 **3 Claims**



Windows for modern housing are usually supplied as one-piece glass panes having the edges set into a channel-shaped frame of relatively rigid material, usually of aluminum or rigid plastic. A simple channel construction for this purpose is described, together with a method of assembling it to the window pane, which greatly reduces the cost of both parts and assembly labor over the previous practice.

3,789,565

METHOD AND SYSTEM OF ERECTING TOWER BUILDINGS

Ragnar O. Lindholm, Valberg, Sweden, assignor to Ragnar O. Lindholm AB, Karlstadt, Sweden

Filed Sept. 24, 1971, Ser. No. 183,342

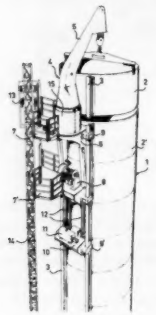
Claims priority, application Sweden, Sept. 25, 1970, 13079/70

Int. Cl. E04b *1/00*

U.S. Cl. 52—747 **1 Claim**

A method and a system of erecting tower buildings from segments of optional cross-sectional shapes to be mounted on

top of each other. The object of the method is to facilitate the erection of tall buildings, such as pulp digesters, silos, chimneys and the like, in which mobile cranes cannot be utilized. This object is realized in that each segment is provided with at least one beam or profile member which serves as a guide for the crane used for the mounting of the segments, the beam or profile members on erection of the building are caused to form for the crane a continuous track which is extended as each further segment is mounted, and the crane is so adapted



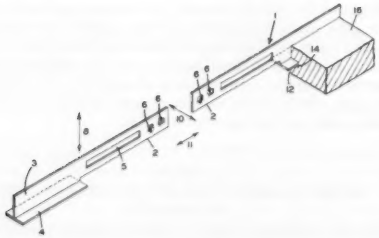
that it can perform a continuous upward climbing movement on the outer side of the building. The systm for carrying out the method includes the crane which is adapted to climb upward along the guides on the outer side of the building as the erection of the building progresses. The crane has a bracket structure which is coupled over jack units adjustable in length to a further bracket structure which serves as a movable abutment. Further, latch means are arranged at the two bracket structures to permit the alternate latching thereof to the guides.

3,789,566

JOINT STRUCTURE FOR SUSPENDED CEILING SYSTEM MEMBER

Joseph W. Boylan, Cincinnati, Ohio, and John W. Shenk, Columbia, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 23, 1971, Ser. No. 211,316
Int. Cl. E04b *5/58*
U.S. Cl. 52—573 **2 Claims**



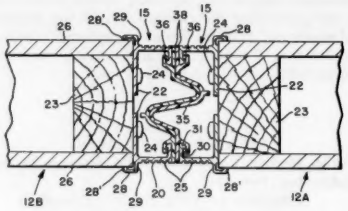
A cross member is provided with a flange which is placed in the edge kerf of ceiling boards. The cross member supports the ceiling boards in position. A joint structure is provided to connect together two adjacent cross members. The joint structure is so arranged with a slot and tab that the two cross members can be somewhat adjustable in length.

3,789,567

EDGE SEALS FOR MULTIPLE-INTERFITTING PARTITIONS

Jerry W. Rae, and Dean S. White, both of New Castle, Ind., assignors to American Standard Inc., New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,730
Int. Cl. E04b *2/74*
U.S. Cl. 52—582 **3 Claims**



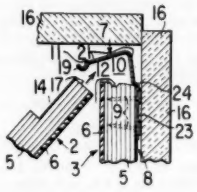
Multiple-use partitions, which may be positioned in a plurality of intersecting arrangements, are provided with vertical edge seals which permit the panels to be positioned in transverse aligned relationship and which also provide for the mutual, right-angle nesting of two, three or four of the panels. The edge seals are formed with seal supports which provide abutting surfaces when the panels are nested in right-angular relationship and which form a light seal to prevent the passage of light across two or more of the panels.

3,789,568

METHOD OF APPLYING A PANEL SYSTEM UTILIZING A CONCEALED CORNER LOCKING CLIP

Jacob M. Mattix, 341 Hennessy, New Orleans, La.

Division of Ser. No. 61,194, Aug. 5, 1970, Pat. No. 3,688,459.
This application Sept. 1, 1972, Ser. No. 285,619
Int. Cl. E04b *1/40*
U.S. Cl. 52—747 **2 Claims**



A concealed corner lock clip system for installing and securing sheet material such as laminated plastic wall-boards, plywood and the like for finishing off bathtub and/or shower walls and the like; the locking system includes a vertically extending resilient clip attached to one wallboard and into which the other, adjacent wallboard can be easily and quickly inserted and locked into place; the clip is unobstructive and compact and is completely invisible after installation.

3,789,569

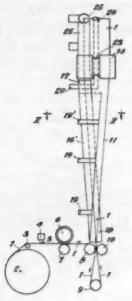
METHOD AND APPARATUS FOR THE STERILE PACKAGING OF SUBSTANCES

Hermann Egger, Ursen, Switzerland

Filed May 18, 1972, Ser. No. 254,565
Claims priority, application Italy, May 21, 1971, 50471/71; Nov. 25, 1971, 54336/71
Int. Cl. B65b *9/12, 55/10*
U.S. Cl. 53—28 **13 Claims**

In producing and filling packages made from a web of packaging material, the web is sterilized and folded lengthwise

in a sterilizing station, a filling hose is introduced which extends to the filling station, the margins of the folded web are sealed together longitudinally and at desired intervals with



partial transverse seals from side of the tube to the filling hose and after the filling station bridging the transverse seals to complete the transverse seals.

3,789,570

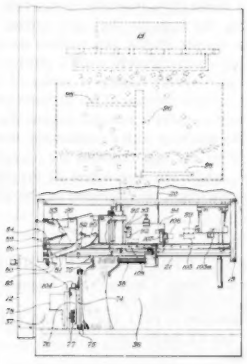
BAGGING APPARATUS AND METHOD

James N. Mullins, Jr., P.O. Box 4340, Forth Worth, Tex.

Filed Nov. 15, 1972, Ser. No. 306,676

Int. Cl. B65b *43/28*

U.S. Cl. 53—29 **16 Claims**



This invention relates to an apparatus and method for automatically bagging material, especially ice cubes, and is particularly adapted to be coin operated. The apparatus includes a carrier having a measuring cavity therein with the carrier being reciprocable between a rearward position where the cavity is filled by the material to be bagged and a forward discharge position where the measured quantity of material is dumped into an open bag. A supply of flattened plastic bags is provided below the carrier and are supported by rods passing through openings in an upward extension of the rear side of the bag. The bags are supported in a bag storage section in such a way that a portion of the rearward wall extension of the bag is inclined upwardly and rearwardly away from the remainder of the bag. When it is desired to open the bag, a rod having a thin lower end is released to engage the inclined surface of the first bag and then is moved along this surface to drop inside the bag and then to partially open the bag. After the bag has been partially opened, a bag supporting means is clamped to the forward side of the bag to move it to a more fully open position and to move the lower end of the bag away from the remaining bags so that a door can be slid between the bag in the filling section and the other bags in the storage section. After the bag has been filled, the bag supporting means is released from the bag and a heat sealing means is actuated to form a heat seal across the upper portion of the bag. The bag can then be pulled from the supporting rods and removed from the machine.

3,789,571

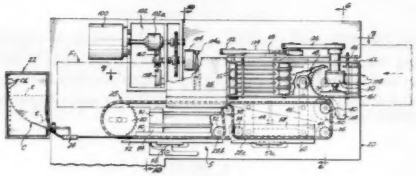
PROCESSOR'S PHOTOGRAPHIC PRINT SORTING AND PACKAGING MACHINE AND METHOD

Leonard H. Tall, Mercer Island; Paul A. Carlstedt, and Arlen J. Erickson, both of Seattle, all of Wash., assignors to CX Processing Laboratories, Inc., Seattle, Wash.

Filed Apr. 14, 1971, Ser. No. 133,885

Int. Cl. B65b *43/26, 57/14;* **B65h** *35/10*

U.S. Cl. 53—54 **18 Claims**



A processor's method and apparatus is disclosed by which previously inspected and quality-marked prints of a customer's order are fed successively past a photoelectrically controlled sorting diverter which directs individual prints either into a reject chute or into selected storage compartments of a tilting loader for reprinting or customer delivery, respectively, such loader having an additional compartment to receive the associated cut films of an individual customer's order. Thereupon the loader, by a decelerating motion, dumps the contents of its respective compartments downwardly with the help of gravity and momentum into the open pockets formed between leaves of a carrier stock section positioned at the loading station and thereafter fed beyond the loading station for detachment from the body of carrier stock by tearing. A first stretch of feed chain advances the carrier stock to the loading station and a second stretch advances the loaded section of carrier stock beyond the loading station where it is torn from the body of the carrier by effecting relatively longitudinal movement between the chain stretches preferably along a preformed score line. Positive engagement of pins on the feed chain with holes in the carrier stock permits feeding and tearing off the sections successively. Separator mechanism coordinated with the tearing mechanism thereafter frees the severed section from the body of stock. Guides progressively spread apart the leaves of the carrier stock on approaching the loading station. Inspection grade marks of a color, contrasting with that of the control marks customarily applied to the print roll margins to time the cutting and the end-of-order stopping of a print cutter, are applied by an inspector and are sensed photoelectrically to control operation of the diverter and a pricing computer.

3,789,572

APPARATUS FOR TEMPORARILY CLOSING CYLINDRICAL CONTAINERS

Hansjorg Tschirky, Ettingen, Switzerland, assignor to Hoffman-La Roche Inc., Nutley, N.J.

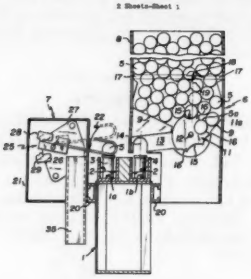
Filed June 30, 1972, Ser. No. 267,807

Int. Cl. B65b *61/22, 43/40;* **B67b** *5/00*

U.S. Cl. 53—381 A **6 Claims**

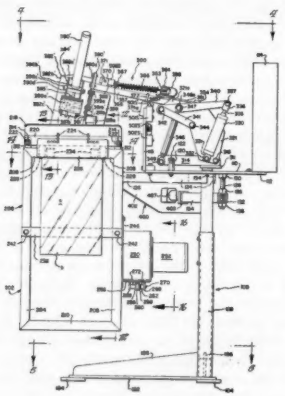
A device is disclosed in which spherical closure members, for example, glass balls, are caused to pass from a reservoir via

a transfer track to a position on the top of cylindrical containers being continuously or intermittently advanced on a moving conveyor. The closure members are singly removed at a point subsequent on the conveyor by being elastically grasped by a transfer track which is then actuated by driving



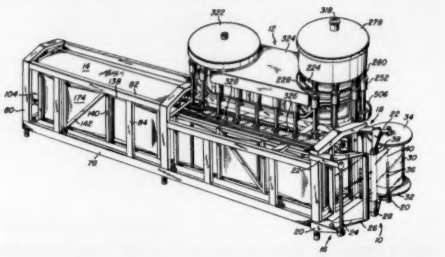
means to become inclined away from the conveyor thus causing the closure member to roll on the track away from the cylindrical container and pass through an aperture in the track to a collection device where from they may again be returned to the reservoir.

3,789,573
AUTOMATIC BAGGING MACHINE
Jasper R. Crabb, Yakima, Wash., assignor to Lobee Pump and Manufacturing Co., Gasport, N.Y.
Continuation of Ser. No. 78,672, Oct. 7, 1970, abandoned. This application Sept. 25, 1972, Ser. No. 291,969
Int. Cl. B65b *43/30, 57/12, 57/04*
U.S. Cl. 53—55 **44 Claims**



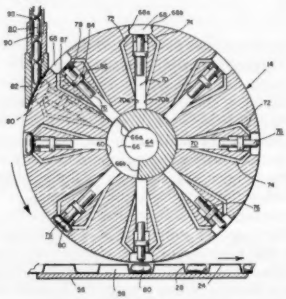
An automatic bagging machine for produce or the like includes bag feeding, holding and tying devices and an electropneumatic control system for actuating and deactuating such devices in timed sequence wherein the bag feeding device feeds and partially opens each empty bag in series, the bag tying device ties each filled bag, and the bag holding devices enters, spreads and clamps each bag fully open for the bag filling operation, closes and swings each filled bag to the tying device for the tying operation, exits from and releases each tied filled bag and returns to the bag holding device for entering the next empty bag in series. In combination with an automatic weighing machine, the two machines are especially adapted to operate together and thereby form an automatic weighing and bagging system, with each machine controlling the operation of the other.

3,789,574
PACKAGING MACHINE
Roy J. Weikert, c/o General Films, Inc., Covington, Ohio
Filed Apr. 12, 1971, Ser. No. 133,308
Int. Cl. B65b *1/00, 57/06*
U.S. Cl. 53—63 **26 Claims**



A machine for filling and sealing each bag in a web of bags on a continuous, non-intermittent basis. The web of bags is formed with the bag side seams extending from the centerfold bottom of the web of the bags to a point short of the top to provide a pair of continuous free upper edges. This permits the bags to be opened by a plow-like device which spreads the free upper edges as the bags are fed into the machine and directs them onto closely spaced teeth carried by a pair of parallel, endless carrier chains. Adjustably spaced, side support belts and a vertically adjustable center belt are also provided to support the bags as they are carried through the machine by the carrier chains. An endless track having one branch extending co-extensively with a portion of the bags' path through the machine carries a series of transfer cans which pick up a desired amount of the product to be packaged from a hopper and transfer it into the bags as they continue to move through the machine with a continuous, non-interrupted motion. After filling the bags the cans are recycled to pick up another charge, while the free edges of the filled bags are sealed and trimmed of excess bag material above the seal.

3,789,575
ARTICLE PACKAGING MACHINE
Charles Frederick Bross, Chicago, Ill., assignor to Pennwalt Corporation, Philadelphia, Pa.
Filed Oct. 4, 1971, Ser. No. 186,134
Int. Cl. B65b *5/00, 5/04, 19/34*
U.S. Cl. 53—160 **10 Claims**



A packaging machine utilizes a rotary drum having a circumferential row of pockets formed in the peripheral surface

thereof for picking up articles from a pick-up zone, and discharging the articles in a discharge zone. The drum contains a plurality of pistons reciprocably confined therein; a single piston is associated with each pocket and includes a plunger which reciprocates into and out of its associated pocket during rotation of the drum about a horizontal axis. A vacuum is applied to each pocket and to the interior surfaces of its associated piston as the pocket traverses the pick-up zone to pick up an article in the pocket and at the same time, hold the plunger inwardly out of the pocket; this vacuum is terminated as the pocket traverses the discharge zone, thus allowing the article therein to be discharged, and the plunger to descend by gravity into the pocket to assist in the discharge if necessary.

3,789,576

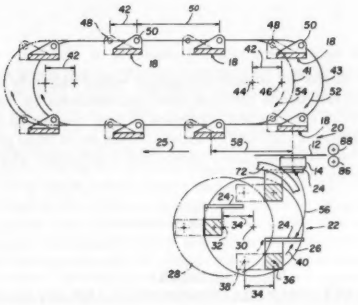
WRAPPING APPARATUS WITH ROTARY HORIZONTAL LIFT

William H. Giles, Westbury, N.Y., assignor to Van Buren Industries, Inc., Westbury, N.Y.

Filed June 5, 1972, Ser. No. 259,450

Int. Cl. B65b *11/36*

U.S. Cl. 53—234 **2 Claims**



A wrapping apparatus for soap bars and the like having a significantly increased production capacity. Product handling in a typical known wrapping device usually contemplates the feed movement of the product into the wrapping station incident to a cranking cycle, and thus a correspondingly restrictive production capability of a single product wrapping per operative cycle. In contrast, the apparatus hereof processes plural products for wrapping per operative cycle, thereby significantly increasing productivity.

Increased productivity is attributable, in large measure, to a horizontal lift mechanism which during a single rotation of its rotary drive engages and transports plural soap bars to a wrapping station. In a noteworthy manner, the lifting surface of this mechanism is maintained in a necessary horizontal orientation throughout its 360° rotative traverse.

3,789,577

THERMAL DEGASSING OF THE PRIMARY COOLANT OF NUCLEAR REACTORS

Gottfried Gramer, Furth, and Roland Korn, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

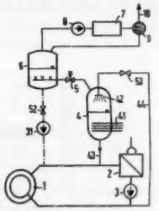
Filed Jan. 28, 1972, Ser. No. 221,727

Claims priority, application Germany, Jan. 30, 1971, P 21 04 356.1

Int. Cl. B01d *19/00, 53/02*

U.S. Cl. 55—42 **6 Claims**

Part of the primary coolant to be degased is fed through the pressure maintenance device wherein the primary coolant is further heated and partially evaporated. The vaporized coolant is withdrawn from the pressure maintenance device



together with the gases released from the coolant and is condensed while the released gases are removed by the adsorption device.

3,789,578

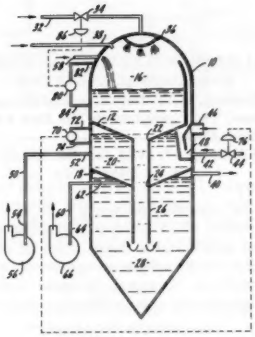
HOT PROCESS UNIT

Anthony A. Askew, Cornwells Heights, Pa., assignor to Ecodyne Corporation, Chicago, Ill.

Filed May 15, 1972, Ser. No. 253,089

Int. Cl. B01d *19/00*

U.S. Cl. 55—39 **14 Claims**



A hot process water softener vessel having a combined treated water storage compartment which is sized to store service water and filter backwash water. The treated water from the zeolite filters enters this compartment through a level control valve which has a limit stop associated therewith to limit the flow rate thereinto to the maximum service flow rate plus the backwash refill rate. When a filter is backwashed the level in the compartment falls regardless of service flow and the level control valve opens up to its limit so that the vessel maximum flow cannot be exceeded. The dirty backwash water is returned to a spray space adjacent the vessel inlet having a level controller to close the raw water inlet valve if the returns are greater than the maximum flow set on the level control valve, such that the level in the spray space rises at the rate of bachwash flow minus the maximum flow set on the level control valve.

3,789,579

REMOVAL OF AIR AND WATER FROM OIL

Ahmad M. El-Hindi, Fabius, N.Y., assignor to Filter Tech, Inc., Manlius, N.Y.

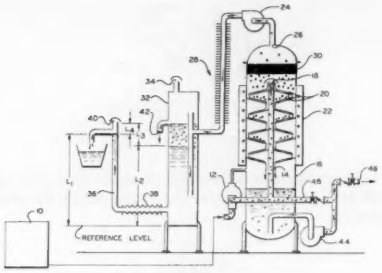
Filed Jan. 10, 1972, Ser. No. 216,422

Int. Cl. B01d *19/00*

U.S. Cl. 55—50 **8 Claims**

A method and system for removing air and/or water vapor from a lubricating oil after use in a process such as aluminum

wire drawing. The contaminated oil is discharged within a container at less than atmospheric pressure, caused to flow in a thin layer over an elongated path, and the escaping air and vapors removed through the top of the container, preferably after passing through a coalescing element. The vapors are condensed and any oil fractions which may have been removed with the water vapor is separated by automatic gravity flow.



3,789,580

REMOVAL OF PHOSGENE FROM AN ESSENTIALLY ANHYDROUS GAS STREAM

Arnold A. Allemang, Stade, Germany, and Howard J. Bachtel, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 17, 1972, Ser. No. 281,527
Int. Cl. B01d *53/04*
U.S. Cl. 55—71 **4 Claims**

A method for removing phosgene from an essentially anhydrous gas stream which involves contacting such a stream with activated alumina at a temperature of from 110°C to 200°C under essentially anhydrous conditions. This method is particularly useful in removing phosgene from chlorinated hydrocarbon gas streams also containing acid gas impurities.

3,789,581

PROCESS FOR INITIAL REMOVAL OF SULFUR COMPOUNDS FROM GASEOUS HYDROCARBON FEEDSTOCKS BEFORE REMOVAL OF ARSENIC THEREFROM

Norman L. Carr, The Hague, Netherlands, and Donald L. Stahlfeld, Glenshaw, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 27, 1972, Ser. No. 247,981
Int. Cl. B01d *53/04, 47/06*
U.S. Cl. 55—73 **15 Claims**

In a process for reducing the arsenic content of a gaseous hydrocarbon stream by contacting the stream with a metal oxide sorbent dispersed upon a supporting material, the improvement comprising first removing sulfur compounds, particularly hydrogen sulfide, from the stream to render it substantially free of sulfur compounds.

3,789,582

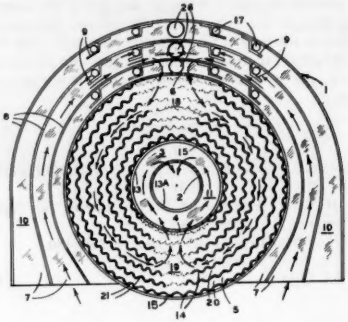
AIR RECTIFIER APPARATUS WITH PROCESS

Paul J. Graybill, 61 Sunset Hill Dr., Pine Orchard, Conn.

Filed Apr. 21, 1971, Ser. No. 135,847
Int. Cl. B01d *45/12*
U.S. Cl. 55—92 **9 Claims**

This application discloses a permanent Air Rectifier with Process which centrifugally separates coarse contaminants through escape ports with some air from a pressured air flow passing through at least one confined narrow curved channel having windward vertical sidewall baffles therein.

This cleaner air being then radically reversed, inertially dislodging additional particles, before passing through enclosed narrow oil soaked corrugated walled channels where extreme turbulance removes finer contaminants by contact cohesion or electrostatic attraction to said corrugated walls, which walls are capillarily oil soaked from an oil filled porous sump, said air being again reversed into a turbulance chamber completing the process.

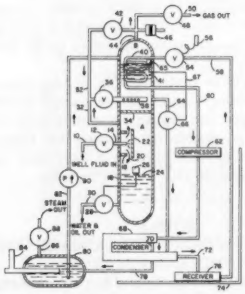


3,789,583

WELL FLUID SEPARATION METHOD AND APPARATUS

James B. Smith, 2605 Fox St., Farmington, N. Mex.

Filed May 7, 1969, Ser. No. 822,396
Int. Cl. B01d *53/14*
U.S. Cl. 55—171 **4 Claims**



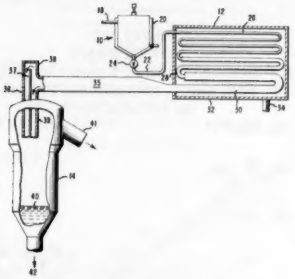
An apparatus for separating liquids and gases in well fluids under pressure wherein the separated gas is passed through a chilled water absorber fluid that creates a temperature barrier to the inclusion of water vapor with the gas leaving the absorber fluid, by condensing the water vapor in the chilled absorber fluid.

3,789,584

APPARATUS FOR SEPARATING VAPOR FROM A VISCOUS LIQUID

John M. Iwasyk, Wilmington, and David W. Rodeffer, New Castle, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 19, 1972, Ser. No. 299,094
Int. Cl. B01d 57/00
U.S. Cl. 55—201 4 Claims



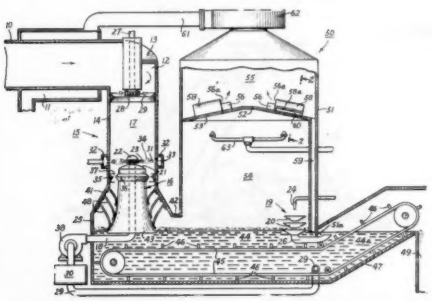
An apparatus is provided for separating vapor from a viscous liquid flowing through a horizontal conduit to the top of an enclosed upright cylindrical vessel and distributing the liquid uniformly to a melt pool centrally rotating about the axis of the vessel. The apparatus comprises a tee-shaped conduit connected to the horizontal conduit so that the through passage of the tee is vertically aligned and enters the vessel. The tee is capped at its upper end. A plate is diametrically positioned in the through passage with one end spaced from the capped end of the tee. The plate extends downwardly beyond the horizontal conduit into the lower end of the tee. A nozzle having a plurality of orifices there-through is connected to the lower end of the tee. The nozzle is in the shape of a sector of a circle with its tip located on the axis of the vessel and has a radius approximately equal to that of the melt pool.

3,789,585

APPARATUS FOR CLEANING GASES

Orlan M. Arnold, Grosse Pointe Park, Mich., and Carlo A. Vancini, Stamford, Conn., assignors to Peabody Engineering Corporation, New York, N.Y.

Filed June 23, 1971, Ser. No. 155,916
Int. Cl. B01d 47/06
U.S. Cl. 55—222 36 Claims



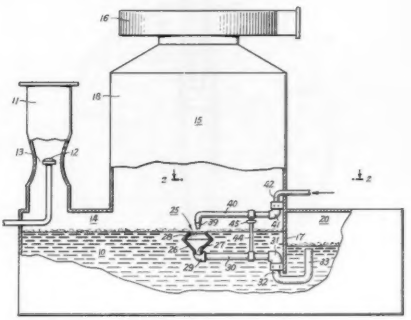
A gas cleaning and drying apparatus wherein a gas stream is passed through an annular gas washing zone, a liquid spray from a fixed nozzle is passed radially outwardly through the gas stream in advance of said throat to remove suspended matter, a reservoir collects the droplets and suspended matter and a dryer unit receives the gas from which the matter has been so removed. The drying unit includes a slotted plate having baffles and deflectors for collecting and removing the liquid droplets.

3,789,586

APPARATUS FOR REMOVING SURFACE FILMS FROM LIQUIDS

Orlan M. Arnold, Grosse Pointe Park, Mich., and Carlo A. Vancini, Stamford, Conn., assignors to Peabody Engineering Corporation, New York, N.Y.

Filed Jan. 7, 1972, Ser. No. 216,184
Int. Cl. B01d 50/00
U.S. Cl. 55—228 6 Claims



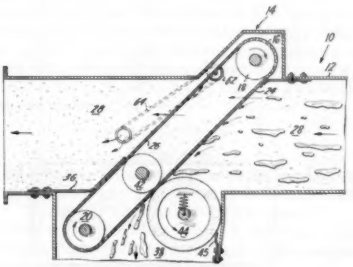
In a reservoir carrying a liquid, a funnel disposed below the surface and movable across the reservoir and a liquid jet disposed to cause the surface film or foam to flow into the funnel from which it is discharged to the outside.

3,789,587

APPARATUS FOR SEPARATING MATERIAL FROM A PNEUMATIC CONVEYOR

James F. Moorefield, II, Blairs, Va., assignor to Loew's Theaters, Inc., New York, N.Y.

Filed May 10, 1971, Ser. No. 141,802
Int. Cl. B01d 46/22
U.S. Cl. 55—290 16 Claims



A device for separating material from a pneumatic conveyor. The pneumatic conveyor includes a duct, which is preferably rectangular in cross-section, for conveying material entrained on a stream of air. The material separator device is interposed in a straight section of the conveyor duct and

operates to remove the material conveyed in the duct while permitting the passage of air. The separator device comprises an air-permeable endless belt arranged to traverse the passageway through the duct and drive means for continuously moving the endless belt across the passageway.

3,789,588

LIQUID SEPARATOR FOR A STEAM-WATER MIXTURE

Fritz Laubli, Einterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed June 2, 1971, Ser. No. 149,231

Claims priority, application Switzerland, June 5, 1970, 8445/70

Int. Cl. B01d *45/12*

U.S. Cl. 55—419 5 Claims

The spigots are tangentially connected to the vertical vessel with the steam-water mixture supply spigots and steam discharge spigots both connected to the upper tube portion. The flow path for the mixture is of constant cross-section between the first and second tube portions while the central tube permits the separated steam to pass upwardly to the discharge spigots.

3,789,589

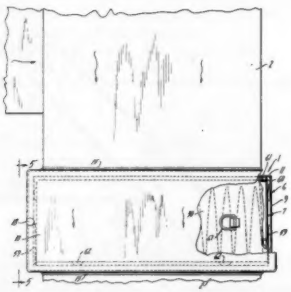
HIGH PERFORMANCE FILTER ASSEMBLY

John J. Delany, and John M. Liebmann, both of Madison, Wis., assignors to Research Products Corporation, Madison, Wis.

Filed Feb. 28, 1973, Ser. No. 336,405

Int. Cl. B01d *46/52*

U.S. Cl. 55—481 22 Claims



A high performance filter assembly includes an outer casing adapted for insertion in the ductwork or plenum of an air treating system. A drawer is removably secured within the casing and contains an improved pleated filter media of the high efficiency type. The upstream portion of the drawer is sealed to the casing by a cam arrangement, and double blankets are disposed at the drawer ends and casing ends to further prevent air leakage. The pleated filter itself is collapsible for easy storage, and expands to a fixed position when installed. Reinforcements on the outermost walls of the pleated filter prevent possible tearing of the filter during its installation and also support said walls during filter expansion. The elongated filter edges are sealed to the drawer by a member which also functions to secure a plurality of filter-supporting fingers.

3,789,590

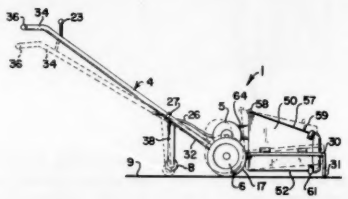
POWER RAKE

Elinor M. Wilson, 4137 Holmes, Kansas City, Mo.

Filed Aug. 7, 1972, Ser. No. 278,563

Int. Cl. A01d *51/00*

U.S. Cl. 56—14.7 5 Claims



A mobile power rake for use in lawns, gardens, and the like comprises a frame having a rake portion extending forwardly therefrom and a handle portion extending rearwardly from said frame and power driven ground engaging wheels rotatably mounted on the frame and in vertical spaced relation below the rake portion and a roller mounted on and in depending relation to the handle portion and spaced rearwardly from the wheels and in vertical spaced relation above the wheels whereby the rake portion is spaced above a ground surface when the roller is in engagement with the ground surface. A material receiving receptacle is mounted on the frame and has an entrance adjacent the rake portion for receiving debris from the rake portion.

3,789,591

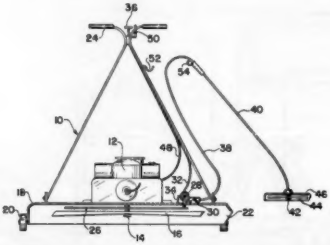
POWER LAWNMOWER WITH AUXILIARY FLEXIBLE DRIVE SHAFT FOR EDGER HEAD

Norman B. Emery, Rt. No. 2, Box 263, Punta Gorda, Fla.

Filed Apr. 11, 1973, Ser. No. 350,191

Int. Cl. A01d *35/20*

U.S. Cl. 56—16.9 1 Claim



The lawnmower is of the type that has a flat cylindrical housing over a set of rotating blades mounted on a vertical shaft which is driven by a motor carried on the housing. As the

mower is moved over the grass, holding the cutter blades at a controlled clearance above the ground, the blades cut the grass to the corresponding height. The vertical shaft is provided with a friction disc mounted thereon for rotation in the housing space above the cutter blades, and a friction wheel is mounted on a horizontal shaft in a pivotal bearing sleeve supported on top of the housing so that the wheel may be spring pressed, through an opening in the housing, to hold the wheel in friction drive relation against said disc. A flexible drive shaft extends from the end of said horizontal shaft through a flexible casing having a rigid tubular handle portion at its outer end to serve as a handle for cutter head.

3,789,592

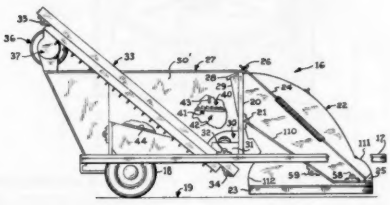
PECAN HARVESTING MACHINE

W. Jack Croft, Wichita Falls, Tex., assignor to Wichita Engineering Co., Inc., Wichita Falls, Tex.

Filed Oct. 12, 1971, Ser. No. 188,188

Int. Cl. A01g *19/00*

U.S. Cl. 56—328 R **7 Claims**



A self propelled harvesting machine for picking up nuts along with debris from the surface of the ground and separating the nuts from the debris so as to enable one person to mechanically harvest an entire crop of nuts such as pecans. The machine has a special pick-up device which utilizes spaced apart sweepers which mechanically urges material to travel through a floating head with the aid of a current of air. This action transfers the nuts into a separator where the nuts and debris are separated from one another by utilization of both air and mechanical separation means. A squirrel cage type separator finally removes the remaining debris from the nuts.

3,789,593

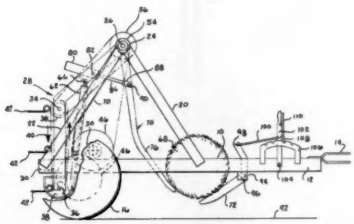
HAY ROLLING MACHINE WITH PICKUP MEANS

Albert M. Best, New Holland, and Robert M. Alverson, Lancaster, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Dec. 7, 1972, Ser. No. 313,037

Int. Cl. A01d *39/00*

U.S. Cl. 56—341 **13 Claims**



A hay rolling machine adapted to form rolls of hay from a swath or windrow thereof in partially cured condition while lying on a field to form a roll of hay of substanial size and weight as the machine is moved along the field by a tractor or otherwise. The machine as provided with roll pickup means respectively adjacent the forward and rearward ends of the machine and including sets of fingers respectively movable toward each other in a manner to raise a roll of hay a sufficient distance to enable the machine to move the roll of hay while the roll is suspended upon said fingers.

3,789,594

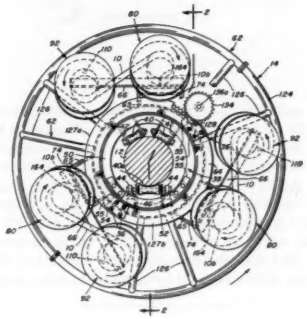
WRAPPING APPARATUS

David B. Rees, Ben Avon Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed June 6, 1972, Ser. No. 260,157

Int. Cl. B65h *81/06*

U.S. Cl. 57—10 **15 Claims**



A wrapping apparatus for wrapping a strip material about an elongated member on a suspension type bridge having a guide member mounted above said elongated member is disclosed.

The wrapping apparatus has a torque stay frame depending from the guide member and movable on the guide member. A frame is secured to the torque stay frame and is movable on the elongated member. A flyer is rotatable with respect to the frame and the elongated member. A strip material feeding means is rotatably mounted on the flyer and has the free end of the strip material attached to the elongated member so that rotation of the flyer relative to the elongated member wraps the strip material about the elongated member.

A longitudinal drive means has a drum rotatable on the frame and a rope member is connected to the drum and to the elongated member. Connecting means are between the longitudinal drive means and the flyer so that rotation of the flyer causes rotation of the drum with attendant winding of the rope member on the drum and resultant predetermined linear movement of the wrapping apparatus with respect to the elongated member for each revolution of the flyer with respect to the elongated member.

3,789,595

AUTOMATIC CONTROL SYSTEM FOR CORRECTING TEXTILE MACHINERY MALFUNCTIONS FROM SENSED AND STORED MALFUNCTION DATA

Barry E. Bernstein, Warwick; Robert S. Erbstein, Coventry, and Thomas Pazis, North Kingstown, all of R.I., assignors to Leesone Corporation, Warwick, R.I.

Filed Dec. 20, 1971, Ser. No. 209,774

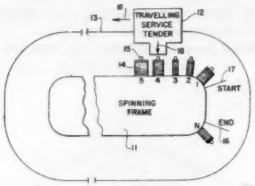
Int. Cl. D01h *13/32*

U.S. Cl. 57—34 R **40 Claims**

A spinning frame having a plurality of spindles with bobbins thereon being wound simultaneously with yarn has a travelling service tender that monitors each spindle work station over a

trip through all spindle positions to determine and correct malfunctions performed by an automatic service cycle performed at each spindle location work station requiring attention. Thus, full bobbins are detected and doffed, roll wraps are detected and stations disabled, flag down spindles are bypassed, and improper yarn feed is sensed and corrected by the service tender for each station encountered on a trip requiring such service.

Stored data is retained to indicate the position and type of malfunctions and various indications of the machine performance and efficiency. Counters store data individually for each spindle and accumulate data for all spindles traversed. Provision is made to control the machine operation from either the detected or stored data by modifying the service cycles, the service trips, or shutting down operations if the danger of machine damage occurs. Alarms or other controls are operated from the stored data if the machine efficiency indicates the need for service outside the automatic tender operation, and the data is retained for indication of machine performance, efficiency and for trouble shooting analysis.



3,789,596

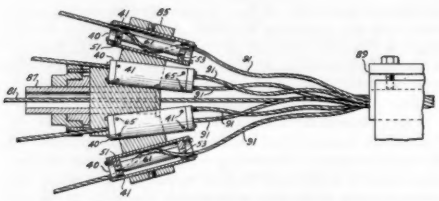
ADJUSTABLE QUILL AND QUILL HEAD MOUNTING THEREFOR

Joseph L. Richley, Williamsport, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed June 14, 1972, Ser. No. 262,813

Int. Cl. D07b *3/00*; **D01h** *13/04*

U.S. Cl. 57—55 **14 Claims**



An adjustable quill has a tubular housing, in both ends of which semicircular disks are adjustably mounted. The relative positions of the edges of the said disks serve to define opposite ends of a spiral preforming path for a wire strand being drawn through the tubular housing. The spiral preforming path within the housing between the adjustable end disks follows the outer circumference of a cylindrical structure extending between the two end disks and comprised, in a preferred embodiment for some purposes, of a series of rotatable disks, or, alternatively, for other purposes, of an extended rod or tubular member.

In some embodiments the tubular housing for the adjustable quill may be omitted if a specially designed quill head is used to mount the quills.

A quill head for adjustably mounting the adjustable quills is also disclosed to be formed from a series of circular plates mounted upon a shaft. The plates have apertures into which the adjustable quills are mounted. A chain and sprocket arrangement may provide uniform adjustment between the adjustable end disks of a series of adjustable quills mounted in the plates of the quill head.

3,789,597

APPARATUS FOR THE SPINDLELESS SPINNING OF TEXTILE FIBERS

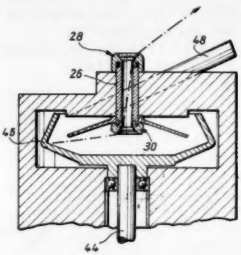
Rudolf Schon, Stuttgart, Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed June 20, 1972, Ser. No. 264,529

Claims priority, application Germany, June 21, 1971, P 21 30 722.2

Int. Cl. D01h *7/00, 1/12*

U.S. Cl. 57—58.89 **10 Claims**



Spindleless twisting apparatus employing a rotating open face spinning chamber provided with a coaxially arranged outlet through which the spun thread is pulled from its binding or splicing point on the wall of the chamber. The outlet is provided at, at least its end, adjacent the chamber and arranged sequentially in the direction of travel of the thread, at first deflecting zone, with a frictional contact or rubbing zone, followed immediately thereafter with at least one additional deflecting zone.

3,789,598

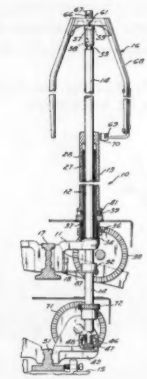
ROVING FRAME BOLSTER

John P. Kieronski, Charlotte, N.C., assignor to Whitin Machine Works, Inc., Charlotte, N.C.

Filed Oct. 26, 1971, Ser. No. 192,074

Int. Cl. D01h *7/12, 7/42*

U.S. Cl. 57—71 **18 Claims**



A vibration free mounting arrangement for a spindle assembly in a roving frame wherein the spindle shaft is softly suspended to produce a natural frequency of vibration substantially below the frequency of vibration inducing forces on

the spindle assembly when the assembly is operating at relatively high speed. The mounting arrangement, preferably, includes a resiliently mounted bolster tube for pivotally supporting the spindle assembly and a stabilizer assembly which dampens residual oscillatory motion of the spindle assembly.

3,789,599

CORRECTION OF ERRORS OCCURRING IN ELECTRONIC TIMEPIECES

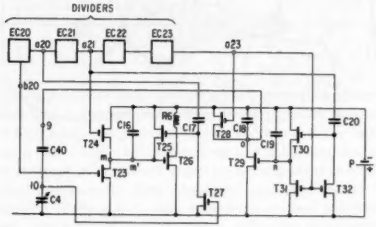
Peter Dome, Brugg Bei Biel, Switzerland, assignor to Societe Suisse Pour L'Industrie Horlogere SA, Geneva, Switzerland

Filed Oct. 20, 1972, Ser. No. 299,327

Claims priority, application Switzerland, Oct. 25, 1971, 15484/71

Int. Cl. G04c *3/00*

U.S. Cl. 58—23 R **17 Claims**



The indicator gear train of a timepiece is driven in dependence upon periodic signals derived from a time base. The gear train includes a rotatable element which can periodically separate the electrodes of a variable capacitor comprising two electrodes biased one against the other with the interposition between them of a dielectric layer. An error detector circuit can be used to detect errors in the gear train position by comparing signals derived from the time base with signals dependent upon the value of the variable capacitor.

3,789,600

ELECTRONIC TIME MEASUREMENT

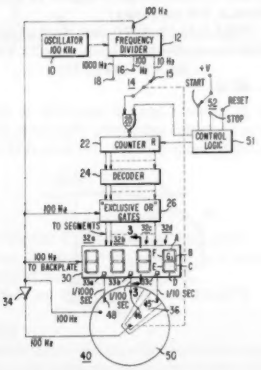
Paul Leonard Champan, Mortlake, London, England, assignor to RCA Corporation, Princeton, N.J.

Filed Sept. 22, 1972, Ser. No. 291,314

Claims priority, application Great Britain, June 2, 1972, 25,790/72

Int. Cl. G04f *3/06, 7/04*

U.S. Cl. 58—39.5 **9 Claims**



A display which includes a plurality of numeric indicators is driven at one of a number of frequencies such as 10, 100 and 1,000 Hz, for measuring time in increments such as tenths, hundredths or thousandths of a second. A switch is provided for enabling the user to change from one frequency to another. The switch also is connected to decimal point indicators on the display for automatically selecting the decimal point appropriate to the frequency selected.

3,789,601

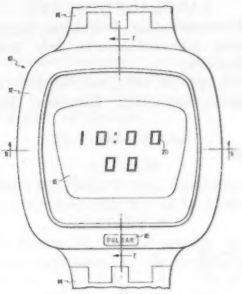
SOLID STATE WATCH WITH MAGNETIC SETTING

John M. Bergey, Lancaster, Pa., assignor to Time Computer, Inc., Lancaster, Pa.

Division of Ser. No. 138,557, April 29, 1971. This application July 15, 1971, Ser. No. 162,813

Int. Cl. G04b *19/30, 27/00*

U.S. Cl. 58—50 R **5 Claims**



Disclosed is a solid state electronic wristwatch with no moving parts. The watch electronics are hermetically sealed in the watch case to be free of dust and moisture and the sealed components are resiliently mounted for improved shock resistance. Two setting switches and a demand switch within the casing are operated from outside the watch by permanent magnets, the demand magnet operating with a demand pushbutton. The setting magnet may be stored in the watch bracelet.

3,789,602

DAY-DATE ADVANCING STRUCTURE FOR A TIMEPIECE

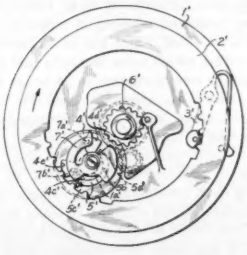
Isao Nemoto, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Oct. 6, 1972, Ser. No. 295,628

Claims priority, application Japan, Oct. 7, 1971, 46-79048

Int. Cl. G04b *19/24*

U.S. Cl. 58—58 **3 Claims**



An improved calendar advancing member for a calendar timepiece includes a calendar advancing wheel and at least

one resilient finger mounted thereon and driven thereby through an intermittent indexing sequence whereby the calendar display is indexed to a next successive day and date position each 24 hours. The one or more resilient fingers are resilient and spring-like in a first position whereby the calendar display may be driven through a calendar correcting sequence without effecting damage thereto. However, they are rigid as driven by the calendar advancing wheel through intermeshing engagement with the calendar display member for indexing thereof.

3,789,603

DAY CALENDAR TIMEPIECE WITH MULTIPLE LANGUAGE DISPLAYS

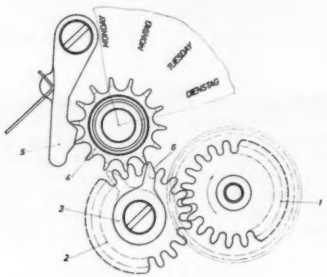
Alfred Eisele Uhrentechniker, Pforzheim, Germany, assignor to Pforzheimer Uhren-Rohwerke Inh. Rudplf Wehner, Pforzheim, Germany

Filed June 29, 1973, Ser. No. 375,155

Claims priority, application Germany, July 31, 1972, 2237645

Int. Cl. G04b *19/24*

U.S. Cl. 58—58 **5 Claims**



A day-indicating disc bears inscriptions of the names of the days of the week in a plurality of languages. Said insciptions have a uniform angular spacing. The inscriptions of the names of each day in all said languages are disposed adjacent to each other in a regular succession. The inscriptions of the names of the days of the week are arranged in a chronological succession in a given sense. A day-shifting wheel is coupled to said disc and has an annular series of teeth which have the same angular spacing as said inscriptions. A rotatably mounted day-shifting finger is provided, which has an inclined back. Timing means are provided, which serve to rotate said finger in a forward sense through one revolution in 24 hours. Setting means are provided, which are manually operable to rotate said finger in a reverse sense. Said finger is arranged to engage said teeth with the side of said finger opposite to said back to a relatively large depth and to rotate said wheel in said given sense through a predetermined plurality of said angular spacings during each revolution of said finger in said forward sense. Said predetermined plurality is equal to said plurality of languages. Said finger is also arranged to engage said teeth with the back of said finger to a relatively small depth and to rotate said wheel opposite to said given sense through said angular spacing during each revolution of said finger in said reverse sense.

3,789,604

DIGITAL WATCH

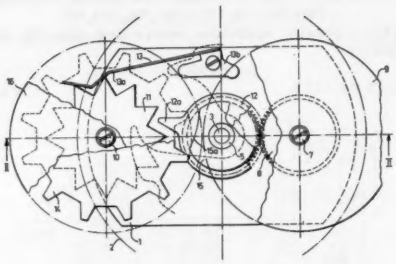
Zeno Hurt, Mohlin, Switzerland, assignor to Agon Uhrenfabrik Robert Triebold AG Mumpf, Switzerland, Germany

Filed Feb. 20, 1973, Ser. No. 333,456

Claims priority, application Switzerland, Feb. 29, 1972, 2838/72

Int. Cl. G04b *33/00, 19/06*

U.S. Cl. 58—59 **4 Claims**



A digital watch or timepiece with a cam disk seated upon a cannon pinion and provided with an indexing or switching cam for the stepwise indexing or rotation of an hour dial equipped with an indexing or pillar wheel. A security gear is rigidly connected with the pillar wheel, the security gear having teeth which are offset by one half of a tooth spacing with respect to the teeth of the pillar wheel. A circular security disk is rigidly connected for rotation with the cam disk, the security disk being provided with a recess which is symmetrical with respect to a radius directed towards the indexing cam. The recess possesses a size which is just sufficient to insure that in each instance only then, when the cam disk further rotates the pillar wheel, a single tooth of the security gear can pass the security disk.

3,789,605

GOLD PLATED CASES FOR TIME-KEEPING INSTRUMENTS

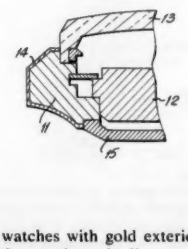
Motoki Kishida, Okaya, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed July 22, 1971, Ser. No. 165,008

Claims priority, application Japan, July 23, 1970, 45-63972

Int. Cl. G04b *37/00*

U.S. Cl. 58—88 R **3 Claims**



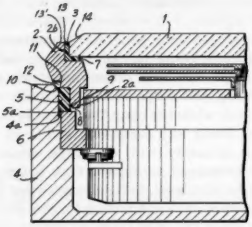
Water proof watches with gold exterior comprise heavily gold-plated stainless steel case bodies.

3,789,606

WATERTIGHT WATCH CASE

Syoji Isono, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Nov. 20, 1972, Ser. No. 308,046
Int. Cl. G04b 37/08
U.S. Cl. 58—90 R 9 Claims



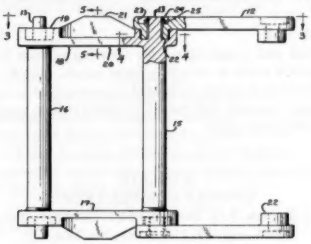
A watertight watch case wherein a glass is fixed to a bezel by interposing an L-shaped plastic ring in interference manner in a space formed by the glass and bezel, and wherein the bezel is fixed to a case body by interposing a plastic ring in interference manner in a space formed by a peripheral projection extending downwardly from the bezel and case body. This construction of the watch case provides excellent waterproof qualities even after the watch case is subjected to several assembling or disassembling operations.

3,789,607

INTEGRAL CAST PIN TYPE CHAIN

Dennis A. Cranor, Milwaukie, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed May 30, 1972, Ser. No. 257,618
Int. Cl. F16g 15/12
U.S. Cl. 59—84 6 Claims



A drag chain is disclosed having a series of rectangular block links with a laterally projecting integral connection pin at each corner. Side bars are rotatably secured to the connecting pins.

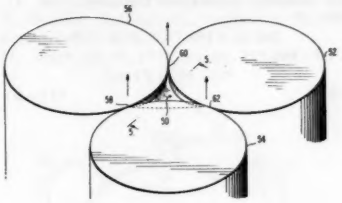
3,789,608

TYPE OF COLLOID PROPULSION

Bernard A. Free, Derwood, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Oct. 14, 1971, Ser. No. 189,279
Int. Cl. F03h 5/00
U.S. Cl. 60—202 5 Claims

In a colloidal thruster, electrically conductive liquid propellant passes through passages having precisely defined sharp angles at specific points at the exit opening of the passages. Sharp cusps of the liquid propellant are formed at the specific points and due to a stronger electric field gradient near the cusps, caused by an electrode in the vicinity of the exit openings which is charged oppositely to the liquid propellant



and by the sharpness of the cusps, the colloidal droplets will be formed at and will be ejected from the cusps. The droplets will be more uniform in size and will be ejected in a more uniform direction than in prior art devices.

3,789,609

PROPULSION METHOD USING 1-ISOPROPENYL-2-FERROCENOYL-CARBORANE BURNING RATE CATALYST

William E. Hill, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 805,385, March 7, 1969. This application Oct. 30, 1970, Ser. No. 85,826
Int. Cl. F23r 1/18
U.S. Cl. 60—219 2 Claims

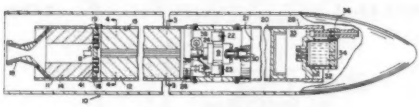
1-isopropenyl-2-ferrocenoylcarborane. This compound may be employed as an acceleration burning rate catalyst in order to promote the burning rates of propellant compositions such as solid composite propellant compositions.

3,789,610

TANDEM SOLID-HYBRID ROCKET MOTOR

William C. Stone, Huntsville, Ala., assignor to The United States of America, as represented by the Secretary of the Army, Washington, D.C.

Filed June 21, 1967, Ser. No. 649,420
Int. Cl. F02k 3/00
U.S. Cl. 60—245 9 Claims



A single-chamber rocket motor containing both a hybrid fuel charge (with associated oxidizer) and a solid propellant charge. Termination of the hybrid motor at the time desired provides accurate missile range zoning. The hybrid fuel charge is in tandem with and forward of the solid propellant charge which provides the minimum impulse of the rocket motor and the minimum missile range. The volume vacated by the solid propellant charge serves as a mixing chamber for more efficient hybrid fuel charge combustion. A gas mixer baffle plate separates the two charges and provides additional mixing.

3,789,611

BRAKE VALVE FOR A HYDRAULIC BRAKE INSTALLATION

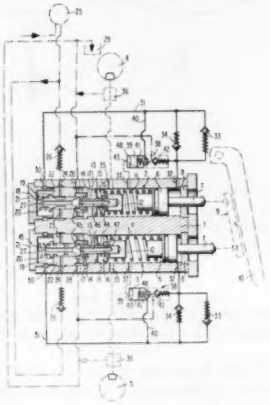
Friedbert Marquardt, Korb, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Feb. 17, 1972, Ser. No. 227,038

Claims priority, application Germany, Feb. 17, 1971, 2107478

Int. Cl. F15b 7/08; B60t 15/04

U.S. Cl. 60—566 31 Claims



A brake valve for a hydraulic brake system especially of a motor vehicle which includes a master cylinder with a master piston that is actuatable by way of a piston rod; the pressure space of the master cylinder is connected with the brakes while its backside is adapted to be actuated by an additional regulated servo pressure; the pressure space of the master piston is provided with a valve which is kept open by the regulated servo pressure when the brake is actuated and thereby connects the pressure space with the pressure control valve; the latter is constituted by a displaceable piston guided within a valve bushing.

3,789,612

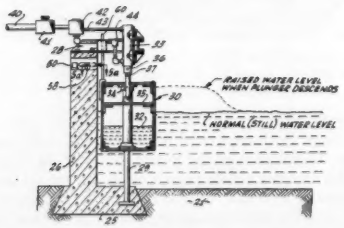
METHOD OF SURF GENERATION

George E. Richard, 207 42nd St., Manhattan Beach, Calif., and Eugene D. Richard, 11570 Victory Blvd., North Hollywood, Calif.

Division of Ser. No. 56,314, July 20, 1970. This application Mar. 27, 1972, Ser. No. 238,080

Int. Cl. E02b 3/00

U.S. Cl. 61—1 7 Claims



A tapered enclosure for a body of water has a wave generator positioned in a relatively narrow and deeper end. In one form, the wave generator is a buoyant plunger mounted for vertical reciprocation within a chamber having a shorewardly facing opening. Through a cyclic control system, the plunger is driven in phase with the forces of gravity and buoyancy acting thereon, starting from a rest position through strokes of increasing amplitude until a desired steady state is attained to sequentially produce waves of a desired energy. Provision is made for varying the mass of the plunger and varying the input from a prime mover as a means of adjusting wave energy and frequency.

An alternative single-wave generator comprises an open bottom water-tight enclosure having air purge valves on its upper face and connected to a prime mover for raising the tank. Upon lowering, the purge valves open, allowing air to escape from the tank while the open lower end of the tank enters the water for filling to a predetermined level. Upon the tank being pulled upwardly, with the purge valves closed, a volume of water contained within the tank is upwardly displaced, above still water level, and released when the hydrostatic equilibrium between the contained water and the outer water is upset, as when the open lower end of the tank breaks the surface of the water.

The tapered planform and sloping floor of the enclosure provide a wave energy conserving contour, so oriented with respect to the generator as to provide a primary wave break trajectory of optimum length for the area utilized by the system. A compound floor curvature may be provided to define a wave regenerating cavity to form a secondary wave out of the energy of a previously broken primary wave. A water inlet is disposed adjacent the wave generator and an outlet or outlets are disposed adjacent a point or points of wave dissipation, along the shallow end of the enclosure, to provide a circulatory system adapted for convenient monitoring and maintaining of optimum water quality.

3,789,613

COMPOSITION AND METHOD FOR DIMINISHING THE FLOW OF WATER INTO PERMEABLE STRATA

Willis G. Routson, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 44,609, June 8, 1970, Pat. No. 3,687,200. This application Aug. 3, 1972, Ser. No. 277,764

Int. Cl. E02b 3/00

U.S. Cl. 61—1 R 10 Claims

A method and composition for treating porous formations through which water is escaping from ponds, canals, etc., said method utilizing a stable colloidal dispersion of a water-soluble, synthetic organic polymeric polyelectrolyte and a water-insoluble inorganic solid.

3,789,614

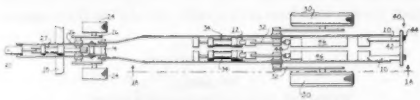
COMPLETE PIPELAYER

Thelmer A. Rogers, P.O. Drawer 1589, Lubbock, Tex.

Filed Aug. 29, 1972, Ser. No. 284,562

Int. Cl. A01b 3/64; F16l 1/00

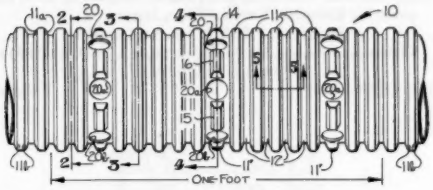
U.S. Cl. 61—72.6 25 Claims



Pipe to be laid underground is laid on the ground connected. Vibrating rippers straddle the pipe and shatter the ground on either side of the path where the pipe is to be laid. The rippers are tied together so they have no resultant horizontal vibration, but each is free to vibrate vertically. The rippers are vertically vibrated out of phase. A chute behind the rippers push the shattered soil laterally and guide the pipe

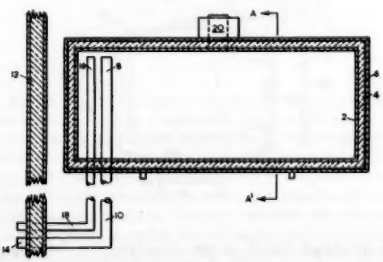
to the bottom of the trench thus formed. The front of the chute has doors which open to permit the chute to be pushed down over the pipe and to be picked up from the pipe, but which are closed during operation.

3,789,615
LIGHTWEIGHT HIGH COMPRESSIVE STRENGTH DRAINAGE PIPE
Ernest J. Maroschak, Roseboro, N.C., assignor to Plastic Tubing, Inc., Roseboro, N.C.
Continuation-in-part of Ser. No. 228,508, Feb. 23, 1972. This application June 12, 1972, Ser. No. 261,781
Int. Cl. E02b *11/00*; F16l *11/12*
U.S. Cl. 61—11 **14 Claims**



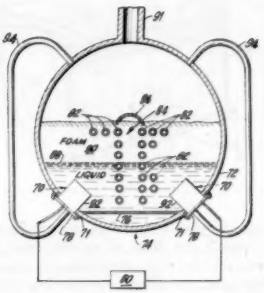
A corrugated plastic drainage pipe having a compressive strength of at least 1,000 pounds per linear foot and being of lightweight construction with a wall thickness no greater than about one-sixteenth inch and wherein spaced apart successively arranged annular ribs with interconnecting annular valley portions therebetween define corrugations along the periphery of the pipe, the ribs and valley portions per foot each being about seventeen in number, the majority of the annular ribs being uninterrupted and arranged in spaced groups with an interrupted rib between adjacent groups, and each interrupted rib comprising a set of three interconnected circularly arranged spaced apart arcuate rib segments correspondingly arranged throughout the pipe, and one of the rib segments of each set being substantially longer than the other two rib segments and having an arcuate extent of at least 180 degrees.

3,789,616
EVAPORATION SYSTEM
Harold Davidge, London, England, assignor to The British Oxygen Company Limited, London, England
Filed June 23, 1971, Ser. No. 156,018
Claims priority, application Great Britain, June 24, 1970, 30577/70; Apr. 16, 1971, 9586/71
Int. Cl. F17c *7/04*
U.S. Cl. 62—50 **21 Claims**



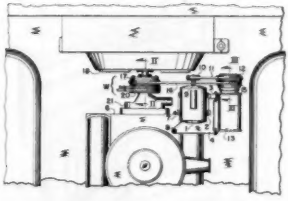
A system for preserving perishable goods in an enclosed transport container including an insulated evaporator for liquefied gas arranged to produce a layer of cold dense gas to envelop the goods and to maintain them at a temperature below ambient.

3,789,617
THERMODYNAMIC SYSTEM
Robert L. Rannow, Jamaica, Vt., assignor to Thermocycle, Inc., Brooklyn, N.Y.
Filed Jan. 13, 1972, Ser. No. 217,467
Int. Cl. F25b *1/00*
U.S. Cl. 62—115 **18 Claims**



Transducers are utilized to produce vibrations within a thermodynamic system including an evaporator, a condenser, and a plurality of pipes connecting the evaporator and condenser so that the refrigerant can circulate therethrough. Other conventional cooling system components such as a compressor and a cooling tower may be included. Preferably one or more transducers are attached to the evaporator and may be enclosed within it. The vibrations reduce the refrigerant and water film coefficients, inhibit the formation of a film of bubbles on the tubes of the evaporator, increase foaming, and generally improve heat transfer throughout the system.

3,789,618
AUXILIARY DRIVE FOR ENGINE DRIVEN AIR CONDITIONER
Jack M. Feliz, 34-808 Via Echo, Palm Springs, Calif.
Filed Aug. 14, 1972, Ser. No. 280,671
Int. Cl. F25b *27/00*
U.S. Cl. 62—236 **3 Claims**



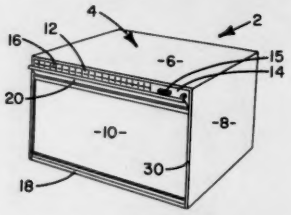
An auxiliary electrical drive means is provided to alternately operate the components of a conventional internal combustion engine driven air conditioner, thus eliminating the need for the secondary roof mounted air conditioner, which is normally provided on recreational vehicles or the like. The dual operation of the aforementioned engine driven air conditioner is accomplished by the means of a pair of self-contained centrifugal clutch assemblies, suitable mounted to the conventional water pump and the air conditioner compressor, thereby automatically disconnecting the power train of the drive means that is not running.

3,789,619

APPARATUS FOR HINGING A DISCHARGE DOOR TO AN AIR CONDITIONING UNIT

James F. Kincaid, Fayetteville, and David E. MacLeod, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 5, 1973, Ser. No. 338,126
Int. Cl. F25d 23/12
U.S. Cl. 62—262 6 Claims



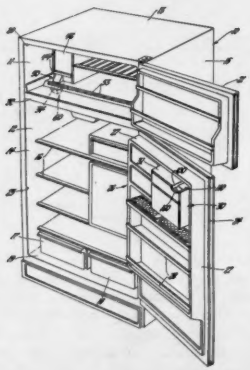
Apparatus for hinging a discharge door to an air conditioning unit to control the flow of conditioned air from the discharge port of the unit, comprises a pair of coaxially disposed hinge pins, the hinge pins having cylindrical body portions which are frictionally engaged by the door and non-cylindrical end portions which are mounted for limited rotation in the housing. The discharge door rotates with the hinge pins to the limited extent the hinge pins are rotatable in the housing, and the door rotates about the hinge pins when the hinge pins are blocked against further rotation. The discharge door opens to the limited extent from its closed position in response to the discharge of air from the discharge port, and is thereafter manually adjustable to control the opening of the discharge port.

3,789,620

ICE DOOR MECHANISM

Louis D. Benasutti, Fairborn, and Jost S. Sucro, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1972, Ser. No. 309,935
Int. Cl. F25c 5/18
U.S. Cl. 62—344 6 Claims



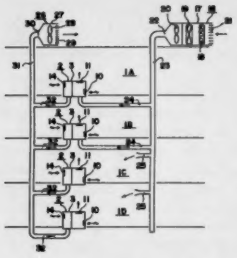
A refrigerator cabinet having a dividing partition with the top freezer compartment having an ice piece dispenser in communication with an upper passageway normally closed by a counterweighted ramp closure on the underside of the partition while the lower compartment door has an enclosure including a lower ice piece passageway forwardly offset from the upper passageway communicating with an exterior ice service area in the lower door. The lower passageway is closed by a closure member which when actuated to an upwardly and rearwardly inclined position engages a follower to pivot the ramp closure to downwardly and forwardly inclined position defining a connecting channel between the passageways. The closure member has delay means to allow all the dispensed ice pieces time to enter the lower passageway before closing thereof.

3,789,621

AIR CONDITIONING APPARATUS

Keizo Inuzuka, Yokohama City, Japan, assignor to A. P. Engineering Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 23, 1971, Ser. No. 183,013
Claims priority, application Japan, June 3, 1971, 46-38911
Int. Cl. F25b 13/00
U.S. Cl. 62—324 7 Claims



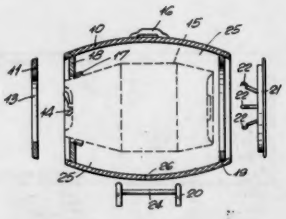
An air conditioning unit divided air-tight into a first section and a second section and installed in a room, comprising an evaporator mounted in the first section, a compressor mounted in the second section and a condenser mounted in the second section, said first section being formed with a fresh air supply port and an air ejection port and said second section being formed with a room air inlet port and an air outlet port.

3,789,622

ICE BOX FOR BEER BARREL

Ralph S. Yanes, Burbank, Calif., assignor to The Raymond Lee Organization, New York, N.Y., a part interest

Filed July 31, 1972, Ser. No. 276,838
Int. Cl. B67d 5/62
U.S. Cl. 62—396 1 Claim



An insulated barrel shape structure for housing and suspending a beer barrel in the horizontal position surrounded by ice. The rear circular cover of the device is removable for the installation and replacement of the beer barrel and surrounding ice. The circular front cover bears a circular opening

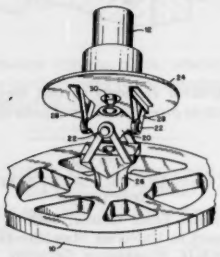
for the spigot of the beer barrel. The structure provides for an air-seal between the sides and bottom of the housed beer barrel and the iced refrigerated area of the structure.

3,789,623

CENTRIFUGE MACHINE

Roger Retali, Saint Cloud, France, assignor to Fives Lille-Cail, Paris, France

Filed May 4, 1972, Ser. No. 250,361
Claims priority, application France, May 4, 1971, 71.15935
Int. Cl. F16d 3/26
U.S. Cl. 64—17 11 Claims



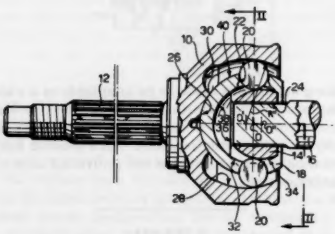
A centrifuge machine has a universal joint mounting the rotor on the rotor shaft for yielding displacement transversely of the rotor and shaft axes.

3,789,624

HOMOKINETIC JOINTS

Domenico Camosso, Turin, Italy, assignor to Riv-Skf Officine Di Villar Perosa S.p.A., Turin, Italy

Filed Mar. 15, 1972, Ser. No. 234,753
Claims priority, application Italy, Apr. 23, 1971, 68357/71
Int. Cl. F16d 3/30
U.S. Cl. 64—21 10 Claims



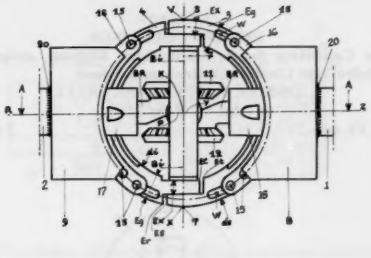
A homokinetic or constant velocity coupling joint having an outer member having a spherical inner surface, an inner member having a spherical outer surface, and a cage locating a plurality of rolling elements between the inner and outer elements. The inner member has a number of longitudinal tracks for the rolling elements and the tracks are shaped so that when a torque tending to rotate the inner member with respect to the outer member is applied the rolling elements are caused to rock across the tracks and to jam against the outer member, the inner surface of which is completely smooth with no tracks, to transmit the torque from one member to the other. Either member can be the driving member.

3,789,625

BISECTING PLANE ROTARY MOTION TRANSMISSION DEVICE

Andre Rene Rey, 93, Rue de la Curveillere, Albi, France

Filed Apr. 20, 1972, Ser. No. 245,874
Claims priority, application France, May 4, 1971, 71.16717
Int. Cl. F16d 3/30
U.S. Cl. 64—21 1 Claim



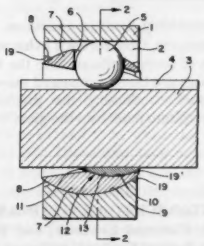
This invention relates to a constant velocity universal joint including a drive shaft, a driven shaft and means interconnecting the shafts for relative swinging movement of the axes of said shafts from 0° to more than 90°. Said means comprising two semi circular forks, a yoke carried on the adjacent end of each of said shafts, a bevel gear carried by each shaft within said fork, a ring mounted for rotation about a diameter of said ring that coincides with the diameter of an articulation of said forks, and pinion gears mounted to rotate on said ring and mesh with said bevel gears.

3,789,626

CONSTANT VELOCITY UNIVERSAL JOINT

Sobhy Labib Girguis, Troisdorf, Germany, assignor to Uni-Cardan AG, Lohmar/Reinl, Germany

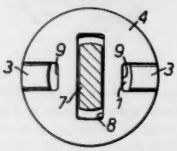
Filed Mar. 21, 1972, Ser. No. 236,602
Claims priority, application Germany, Mar. 25, 1971, 2114536; Dec. 24, 1971, 2164432; Dec. 24, 1971, 2164433; Dec. 24, 1971, 2164431
Int. Cl. F16d 3/30
U.S. Cl. 64—21 46 Claims



A constant velocity universal joint comprises an annular outer joint element having grooves on its inner surface parallel with the axis of the joint. An inner joint element is positioned within the outer joint element and is provided with grooves on its outer surface to form pairs of opposed grooves with the grooves on the outer joint element. A ball is positioned in every pair of opposed grooves and a cage disposed between the two joint elements retains the balls in a plane perpendicular to the axis of the cage. The cage is guided within the outer joint element by a spherical surface on the outer face of the cage and is guided with respect to the inner joint element by a

spherical surface on the inner face of the cage. The centers of the inner and outer spherical surfaces of the cage are equidistant on opposite sides of the plane passing through the centers of the balls. A control device as a separate element or elements is mounted on the inner joint element and is provided with a spherical or cylindrical surface for coaction with the inner spherical surface of the cage.

3,789,627
ROTARY COUPLINGS
John Cambridge Smith, Cheltenham, England, assignor to Hydro-Mite Limited, Cheltenham, England
Filed Oct. 6, 1971, Ser. No. 187,123
Int. Cl. F16d *3/04*
U.S. Cl. 64—31 **3 Claims**



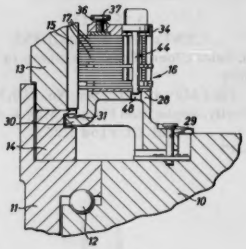
A rotary shaft coupling of the so called Oldham coupling type including a flat metal coupling disc with grooves or slots on two perpendicular transverse axes to engage respectively with teeth or dogs attached to drive discs or flanges attached to the two drive shafts. Two surfaces of the slots or grooves on the coupling disc lie in a common transverse plane to avoid tilting moments on the disc and the disc is formed by a simple punching or stamping operation.

3,789,628
METHOD FOR CONTROLLING FURNACE EMISSIONS
William P. Mahoney, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.
Filed Dec. 23, 1971, Ser. No. 211,761
Int. Cl. C03b *5/16*
U.S. Cl. 65—27 **5 Claims**

Method for scrubbing furnace emissions, and particularly glass furnace emissions, from furnace exhausts, by spraying an aqueous solution of sodium silicate into the hot exhaust gases as the exhaust gases are being exhausted through the glass furnace exhaust stack, collecting the precipitated prill and recycling the precipitate back into the glass batch materials.

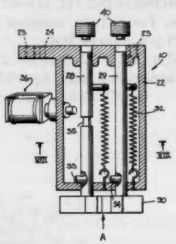
3,789,629
PATTERN DEVICE FOR KNITTING MACHINES
Frederick Henry Carrotte, Leicester, and John Ernest Ellis, Queniborough, both of England, assignors to A. Kirkland & Company Limited, Syston, Leicester, England
Filed Apr. 5, 1971, Ser. No. 131,373
Int. Cl. D04b *15/68*
U.S. Cl. 66—50 R **4 Claims**

A pattern device for controlling a circular knitting machine comprises a frame, a set of selector elements mounted in the frame and adapted to locate knitting elements in the machine to knit a desired pattern at a feeder, means operable to lock the selector elements in the frame and to release them for movement in the frame between effective and non-effective positions, and a pattern member insertable in the frame, a surface on each selector element being adapted for cooperation with the pattern member, and the pattern member having parts for engagement with said surfaces, said parts serving to



position said selector elements so that they will locate the knitting elements to produce a desired pattern.

3,789,630
LOCK OR CAM ARRANGEMENT FOR KNITTING MACHINES
Hans Schieber, and Erich Krause, both of Bopfingen, Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber G.m.b.H., Westhausen, Germany
Filed Oct. 22, 1971, Ser. No. 191,620
Claims priority, application Germany, Mar. 10, 1971, 2111514
Int. Cl. D04b *7/00, 15/36, 35/00*
U.S. Cl. 66—78 **12 Claims**

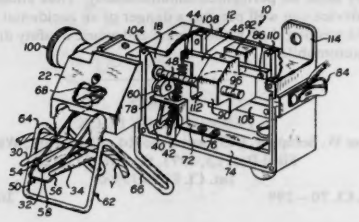


A knitting machine is made to be adaptable to a wide range of knitting patterns and knitting conditions by providing of a carriage, individual cam control structural units or modules which may be individually replaced. Each module has a standard mounting arrangement, but has individual cam and cam control arrangements.

3,789,631
YARN TENSION CONTROL DEVICE
Jose Castillo Deniega, Elmhurst, N.Y., assignor to Stop-Motion Devices Corporation, Plainview, N.Y.
Filed Feb. 8, 1972, Ser. No. 224,424
Int. Cl. D04b *35/14*
U.S. Cl. 66—163 **9 Claims**

A yarn tension control device having yarn tension sensing means adapted to support the travelling yarn, which sensing means is secured to a shaft which terminates in a crank portion. Spring means connected at one end thereof to the crank portion urge the yarn tension sensing means into a normal yarn supporting position against the resistance of the yarn tension. The other end of the spring is secured to the free end of a tension control lever whose opposite end is mounted for

pivotal movement. The lever is straddled by a channeled block and has a bottom curved surface which defines a cam follower



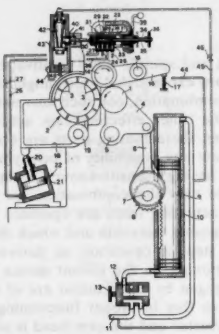
and cam combination with the block, whereby longitudinal movement of the block causes pivotal movement of the lever for varying the tension on the spring.

3,789,632

AUTOMATIC THICKNESS REGULATOR FOR SKIN-SHAVING MACHINES

Silvio Repetto, Modena, Italy, assignor to S.p.A. Luigi Rizzi & C., Modena, Italy

Filed Sept. 25, 1972, Ser. No. 292,095
Claims priority, application Italy, Dec. 15, 1971, 32432/71
Int. Cl. C14b *17/00*
U.S. Cl. 69—42 **10 Claims**



In a skin shaving machine, a mechanism is provided for automatically regulating the thickness of the skin being processed. A shaped surface of a governing piston, shaped so as to present zones of different surface area cooperates with a feeler. The surface area variation of the core keeps into account the thickness trend of the several portions of a skin, viz. head, neck, trunk, hindquarters. By the mechanism so provided a perfectly even thickness of the shaved skin is automatically obtained without requiring the intervention of an operator, the latter being enabled to attend to other machine operations.

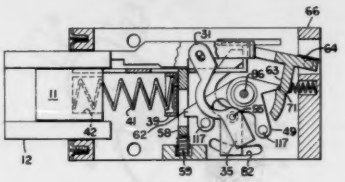
3,789,633

PREASSEMBLED LOCK OF THE UNIT TYPE

Alois Crepinsek, San Jose, Calif., assignor to Security Technology Corporation, San Jose, Calif.

Filed Jan. 17, 1972, Ser. No. 218,365
Int. Cl. E05b *59/00*
U.S. Cl. 70—110 **16 Claims**

A preassembled lock of the unit type is shown having a lock casing and latch-bolt and dead-bolt assemblies slidably mounted in the lock casing. Push lever means is centrically mounted within the lock casing on an axis normal to the direction of travel of the latch-bolt and dead-bolt assemblies. Bolt-moving lever means is eccentrically mounted with respect to the push lever means and operatively engages the dead-bolt assembly. Releasable blocking means retains the dead-bolt assembly in its locked position and rotation of the



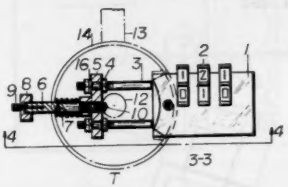
push lever means releases the blocking means and moves the bolt-moving lever means to thereby retract the dead-bolt assembly from its locked to its unlocked position. The rotation of the push lever means is over only a few degrees and can be accomplished in a fraction of a second. The dead-bolt assembly extends an appreciable distance out of the lock casing in its locked position, yet can be retracted in the aforementioned fraction of a second.

3,789,634

SECURITY STEER-GEAR CYCLELOCK

Roland Clough Brown, 425 Stratford Ct., Del Mar, Calif.

Filed Oct. 20, 1972, Ser. No. 299,403
Int. Cl. B62h *5/06, 5/10*
U.S. Cl. 70—186 **10 Claims**



A combination lock is placed on the side of the fork or crank assemblies of a bicycle and inserted far enough to insure that the lock remains locked even when the exposed portion of the lock is sawed off. The sliding lock bolts and pin extend through the fork or crank assemblies and end in a fingergrasp cap to permit the operator to unlock the mechanism when the correct combination is set on the lock dials. The pin has at its inner end a crosshead holding a bolt stud that fits into a hole in the crankshaft or into a hole in the stem of the fork when the bicycle is locked. When the combination lock is unlocked, the stud bolt is pulled back out of connection with the hole in the crank or fork, pinned in this position by the operator during use, and returned to the locked position when not in use, as desired. A spring holds the pin in the locked position at all times unless the combination lock is dialed to open it. If the fingergrasp cap end is sawed off the spring inside the crankcase or fork section continues to hold the pin and bolt stud in the locked position. If the lock end is sawed off the fixed,inserted portion of the lock inside the crankcase or fork assembly continues to hold the sliding bolts in the locked position.

3,789,635

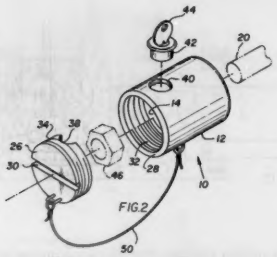
STUD LOCK

John Van Brunt, and Donald Tringali, both of 222 Hudson St., Copiague, N.Y.

Filed Mar. 17, 1972, Ser. No. 235,593

Int. Cl. F16b *41/00*

U.S. Cl. 70—232 **10 Claims**



A stud lock for preventing access to the stud of an automobile wheel and the like by enclosing the stud and its securing nut in a housing, the access to which is closed and opened by a cover that is prevented from accidental displacement by a lockable element.

3,789,636

DEVICE IN AN AUTOMOBILE FOR PREVENTING AN ACCIDENTAL LOCKING OF A STEERING SHAFT

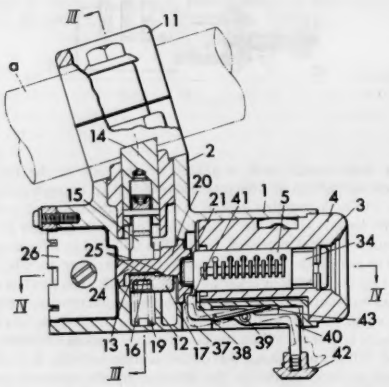
Yoshikatsu Nakashima, Nagoya, Japan, assignor to Kabushiki Kaisha Tokai Rika Denke Seisakusho, Mishikasugai-gun, Aichi Pref., Japan

Filed Mar. 15, 1972, Ser. No. 234,791

Claims priority, application Japan, Mar. 16, 1971, 46-14527

Int. Cl. B60r *25/02*

U.S. Cl. 70—252 **3 Claims**



Device in an automobile for preventing an accidental locking of a steering shaft in such a type of a locking system as a rotor of a cylinder lock is provided with a lock position of the steering shaft. The device comprises a stop provided in said rotor or in an associating locking bolt and a manually-operable means usually urged by a spring means to engage with said stop thereby to check a further rotation of the rotor from an OFF position of an ignition switch further to said lock position. For turning the rotor from the OFF position to the lock position, two manipulations, first, shifting said-manually operable means against the spring means to release it from an engagement with said stop and, second, turning the rotor with a key must be performed simultaneously. Thus constructed, the device can well prevent a danger of an accidental locking of the steering shaft while driving and assure a safety driving of the automobile.

3,789,637

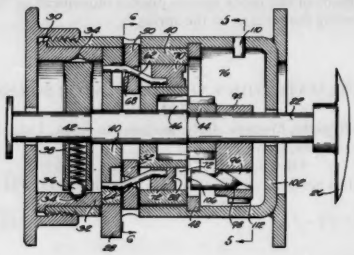
PERMUTATION LOCK

Pieter W. Schipper, 975 Lone Tree Rd., Elm Grove, Wis.

Filed Dec. 23, 1971, Ser. No. 211,428

Int. Cl. E05b *37/00*

U.S. Cl. 70—299 **20 Claims**



Lock handles and spindle have rotative and axial movements, without any exposed dial which might become polished to indicate the combination, one such movement making cam selection and the other effecting cam actuation, selection being made when the actuating parts are completely disengaged to eliminate any possibility of betraying the combination to a person having a sensitive touch. Tumblers readily interchangeable to vary the combination are entirely out of sight. Tumbler actuating cams are operated by an actuator selectively engageable therewith and which shortens progressively in each step of operation to determine its proper sequential functioning. In the instant device the cam heads successively engaged by the actuator are of successively increased length so that in proper functioning the combined length of the actuator and the cam head is always the same. Engagement with an incorrect cam will preclude correct operation and make it necessary for the operator to return to the starting point. Three tumblers are shown; any number within the physical capacity of the device may be used.

3,789,638

ROTARY DISC TUMBLER LOCK CONSTRUCTION

Marvin E. Roberts; Reuben J. Cohn, both of Reno, Nev., and James E. Ward, Atherton, Calif., assignors to Locking Systems, Inc., Reno, Nev.

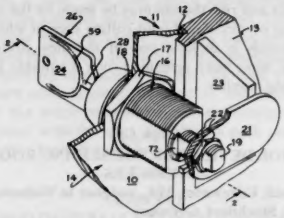
Filed July 28, 1972, Ser. No. 276,146

Int. Cl. E05b *29/02*

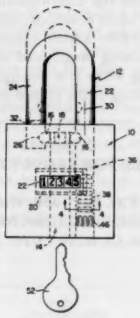
U.S. Cl. 70—366 **17 Claims**

A rotary disc tumbler lock construction of the type having a generally cylindrical body includes a core characterized by a tumbler assembly wherein a plurality of rotary disc tumbler elements are formed with two sets of gate openings in their outer peripheries so that one or the other of the two sets of gate openings can be aligned to accommodate entry of a side bar in response to clockwise and counterclockwise rotation of the tumblers. A key formed with bits for operating the tumblers both clockwise and counterclockwise accommodates the

maximum removal of key material at any given bit position for both clockwise and counterclockwise operation of the key without substantially weakening the shank of the key and in a manner to avoid telltale "footprinting" in the lock when operated.



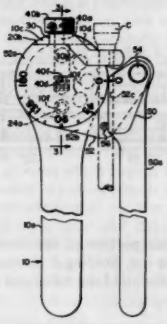
3,789,639
LOCK WITH SECURITY COUNTER
Richard S. Canter, 20 Clent Rd., Great Neck, N.Y.
Filed July 10, 1972, Ser. No. 270,313
Int. Cl. E05b *39/04, 67/22*
U.S. Cl. 70—437 **14 Claims**



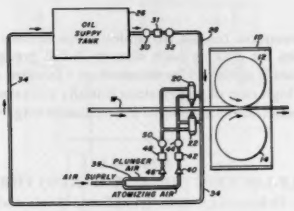
A lock such as a padlock in combination with a registering counter operated by the shackle of the lock for counting and registering the number of times the shackle is moved from unlocked to locked position, in which the acuating link between the shackle and the counter comprises rack and pinion means.

3,789,640
HAND HELD TUBE BENDER
Heinrich H. Frank, Amherst, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.
Filed Aug. 4, 1972, Ser. No. 278,077
Int. Cl. B21d *9/05*
U.S. Cl. 72—36 **18 Claims**

A tube bender is shown which has a handle on which is rotatably mounted a bending mandrel with a tube engaging hook swivably carried by the mandrel and with the mounting for the hook being a crank or eccentric so that when the mounting is rotated the hook is moved toward or away from the groove of the mandrel. The hook is also offset so that it may engage a tube close to the start of the bend point on the mandrel. The mandrel is rotatable on the handle and held in different positions thereon by a detent means. The bending shoe is on the end of a second handle and is pivotably connected to a link plate which is rotatably journalled on an annular bearing surface on the mandrel between the mandrel and the first handle.



3,789,641
METHOD OF LUBRICATING A HOT STEEL WORKPIECE PRIOR TO HOT ROLLING
William G. Miller, Penn Hills Township, Allegheny County, and Raymond E. Polinski, Duquesne, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 75,394, Sept. 25, 1970, abandoned. This application Nov. 13, 1972, Ser. No. 306,076
Int. Cl. B21b *45/02*
U.S. Cl. 72—45 **1 Claim**

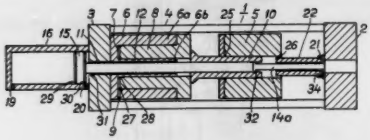


A method of lubricating a hot steel workpiece in the process of hot rolling wherein an undiluted lubricating oil is atomized and sprayed onto the hot steel surface. In order to prevent the oil from flashing and burning upon contact with the hot steel surface, the atomized oil particles are maintained within the range of about 150 to 250 microns in size.

3,789,642
METHOD FOR HYDROSTATIC EXTRUSION OF TUBES
Jan Nilsson, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed June 5, 1973, Ser. No. 367,104
Claims priority, application Sweden, June 12, 1972, 7689/72
Int. Cl. B21c *25/04*
U.S. Cl. 72—60 **1 Claim**

A press for hydrostatic extrusion of tubes includes a high pressure cylinder axially displaceable in a press stand with a die insertable into the cylinder and a pressure generating punch insertable into the cylinder to generate the pressure for extrusion. A mandrel is carried by a rod which passes through the pressure-generating punch. A hollow billet is inserted into

such a structure which has the central opening therethrough at the point adjacent the die of smaller cross-section than that of the mandrel. When the mandrel is advanced towards the die, it



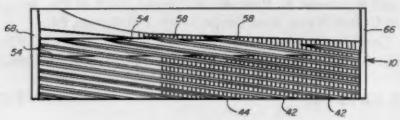
engages the narrowed portion of the bore of the billet and presses it against the die, holding it there while the pressure chamber is advanced around the billet and the extrusion takes place.

3,789,643

DOUBLE ANGLE CUTOFF DIE AND METHOD FOR ROLLING SCREWS

Joseph F. Dickson, Oxford, Mass., assignor to Reed Rolled Thread Die Company, Holden, Mass.

Filed Feb. 10, 1972, Ser. No. 225,242
Int. Cl. B21h *3/06*
U.S. Cl. 72—469 **12 Claims**



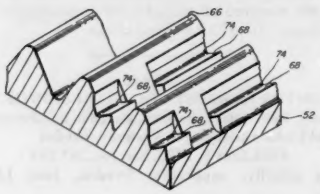
This invention relates to gimlet point screws and thread rolling dies for making such screws. A full precisely formed gimlet point is achieved by means of an extruding cutoff ramp having a high rate of penetration initially followed by a more gradual penetration to remove the extrusion slug.

3,789,644

SELF-LOCKING DIES FOR MAKING THREADS

Roger W. Orlomoski, North Brookfield, Mass., assignor to Litton Industrial Products, Inc., Halden, Mass.

Filed Nov. 22, 1971, Ser. No. 200,933
Int. Cl. B21h *3/06*
U.S. Cl. 72—469 **5 Claims**



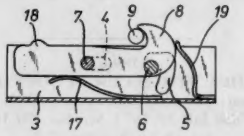
This invention relates to self-locking screws and thread rolling dies for making such screws. The self-locking result is achieved by a rib which may be continuous or discontinuous in the flank or flanks of one or more turns of the threads over a selective length of the screw. The outermost face of the rib is generally parallel to the mating threads so that with standard threads it is disposed at approximately 60° with respect to the oppositely disposed flank on the same thread to provide initial compression and subsequent resilient bending of the rib without scoring the mating thread despite variations in fit. The screw threads and ribs therein may be made by the use of conventional flat or circular thread rolling dies in which certain selective threads in at least one of the dies, preferably the movable die, have been reformed over a suitable length in a corresponding manner.

3,789,645

CONTROL DEVICE FOR THE SLIDING ROOFS OF VEHICLES

Alfred Schmid, Edgewater, Md., assignor to Webasto-Werk W. Baier KG, Stockdorf, Germany

Filed July 27, 1972, Ser. No. 275,718
Claims priority, application Austria, July 27, 1971, 6529/71
Int. Cl. G05g *1/00*
U.S. Cl. 74—491 **10 Claims**



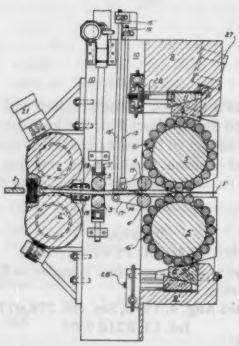
A device for stopping the motion of a vehicle sliding roof panel when it reaches the intermediate closed position from one of two opposite open positions, where a moving pivotable catch hook is engaged by a fixed catching pin, thereby de-activating a hook retaining means and allowing the hook to be retracted by a spring when it is disengaged from the catching pin to permit overriding of the closed position.

3,789,646

PLANETARY MILL FOR PRODUCING SCALLOP-FREE STRIP

Tadeusz Sendzimir, P.O. Box 1350, Waterbury, Conn.

Filed Oct. 5, 1972, Ser. No. 295,345
Int. Cl. B21b *13/20, 29/00*
U.S. Cl. 72—190 **8 Claims**



This application discloses an improvement in planetary rolling mills, making possible a rolling of flat strip, free from scallop, without the need for a planishing mill to smooth out the scallops which are normally produced by a planetary mill. There is also disclosed how the angle of entry of the work rolls into the slab may be reduced, thus reducing the likelihood of

surface defects, or alternatively, making it possible to roll thicker slabs than was possible heretofore on a given size planetary mill. The disclosure teaches that as a particular work roll enters the roll bite, its diametrically opposite work roll engages a cam. The cam has a surface corresponding generally to the circular orbit of the work roll, but is modified so as to deviate from such orbit by a very small amount. An initial deviation may cause the work roll diametrically opposite the rolls which are in engagement with the cam to engage the slab at a more acute angle to the passline, and a final deviation may cause the work rolls which are diametrically opposite rolls in contact with the cam, to follow a path parallel to the passline as they leave the roll bite.

3,789,647

METHOD OF SURFACE-CONDITIONING HEAT-TREATING-FURNACE HEARTH ROLLS HAVING SLEEVES OF REBONDED FUSED SILICA THEREON BY PROCESSING SILICON STEEL STRIP

Jack L. Hamilton, Monroeville Borough; John W. Jenks, Franklin Twp., and John F. Milberger, Washington Twp., all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 20, 1972, Ser. No. 299,533
Int. Cl. B21b *27/04*
U.S. Cl. 72—236 **7 Claims**

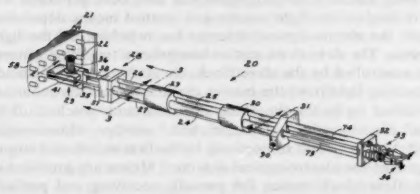
Generally, the method of the invention involves surface-conditioning new and used rebonded fused silica sleeved hearth rolls of a continuous silicon steel strip heat-treating furnace while the furnace is in production operation. Method consists of scheduling the furnace, when new rolls are to be conditioned, to process silicon steel strip product requiring dry annealing in an atmosphere having a maximum dew point of 30°F at a temperature the range of approximately 1,400° to 2,000°F (preferably 1,500°F) and processing such silicon steel strip through the furnace with the strip applying a sustained force normal to the peripheral surfaces of the rolls for a period of 24 to 72 hours. In a modified embodiment of the invention, used rolls are surface-conditioned to remove oxide roll-pickup by scheduling the processing of silicon strip product having rough surfaces through the furnace which requires a dry anneal in an atmosphere having a maximum dew point of 30°F at a temperature ranging from 1,400° to 2,000°F (preferably 1,500°F) and processing such strip through the furnace for approximately 16 hours.

3,789,648

PORTABLE TUBE EXPANDER

Ward A. Ames, Danville, Ill., assignor to Tridan Tool & Machine, Inc., Danville, Ill.

Continuation-in-part of Ser. No. 179,060, Sept. 9, 1971, abandoned. This application Dec. 27, 1972, Ser. No. 318,927
Int. Cl. B21d *53/00*
U.S. Cl. 72—316 **18 Claims**



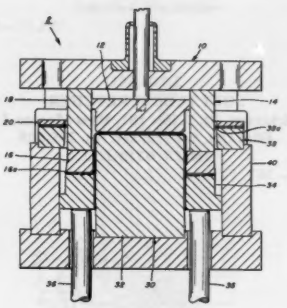
A portable device for expanding tubes. In one embodiment, a pair of movable jaws are pivotally mounted to a block and are spring biased together so as to engage the periphery of the tubes to be expanded. A pair of pistons with rods are slidable within hollow cylinders attached to the block. Each piston rod has a ball-shaped end which is positioned between the movable jaws in the retracted position with each end extendable therefrom into the tubes. A pair of shafts extend sealingly into the pair of hollow cylinders. By moving the shafts further into the hollow cylinders the length of travel of each piston is decreased. The pistons and headed ends are movable in unison together by the application of hydraulic pressure on either side of the pistons. In the preferred embodiment, the rods used to expand the tubes are driven by wheels with aligned peripheral grooves which engage the outer surfaces of the rods. In one version, a pair of wheels are coupled by gears to a hydraulic motor whereas in another version two pairs of wheels are coupled by a gear and chain combination to a hydraulic motor. In the preferred embodiment, the rods extend through a housing in which the wheels are rotatably mounted with the length of travel controlled by stop blocks mounted to the rods which contact the housing when the rods are extended the desired length.

3,789,649

DRAW RING FOR CANS

Ernest J. Clowes, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 16, 1973, Ser. No. 324,162
Int. Cl. B21d *24/04*
U.S. Cl. 72—350 **5 Claims**



An improved die means for sheet metal drawing is provided which permits lower pad pressures and mitigates the problem of earring by the provisions of concentric depressions in at least one of the draw rings.

3,789,650

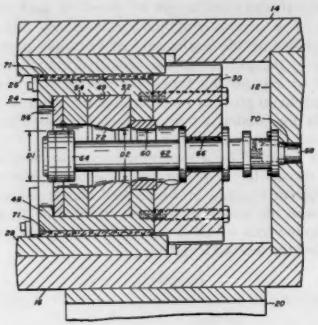
METHOD FOR FORMING REDUCED DIAMETER ENDS ON ELONGATED WORKPIECES

Peter Alexoff, Poland, Ohio, assignor to George A. Mitchell Company, Youngstown, Ohio

Filed July 28, 1972, Ser. No. 275,923
Int. Cl. B21d *41/04*
U.S. Cl. 72—360 **10 Claims**

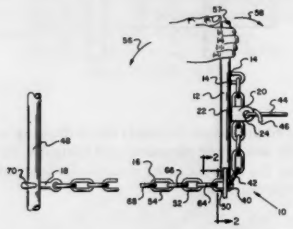
Method for forming reduced diameter ends on elongated workpieces, particularly tubing, characterized in that a tube is

positioned between opposed dies aligned with the tube, one die being movable toward and away from a tube end while the other die is preferably fixed. Forcing the movable die against one end of the tube forces the other end into the fixed die and



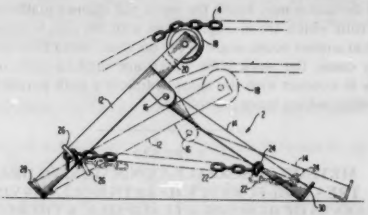
also forces the movable die over the first end, resulting in a reduction in diameter at both ends of the tube during a single power stroke of the movable die. Also described is a novel means for extracting a tube end from a reducing die after the die is forced over the tube end.

3,789,651
SOFT TUBE STRETCHER
James C. Dickerson, Rt. 5, Box 181, West Monroe, La.
Filed Oct. 5, 1972, Ser. No. 295,105
Int. Cl. B21d *3/12*
U.S. Cl. 72—367 **6 Claims**



A stretcher device for use with soft tubing of the type used on control systems having tubing such as hydraulic or pneumatic tubing or the like. The stretcher may be easily carried by the pipe fitter and may be quickly and easily used to stretch the soft tubing to the desired degree of straightness and length. The stretcher has a means for holding the soft tubing and also means for anchoring the stretcher to a chain which is incorporated with the stretcher. Also disclosed is a method for stretching the soft tubing using the stretcher disclosed.

3,789,652
LEVEL TIE-DOWN
Ervin Buske, P.O. Box 190, Gowrie, Iowa
Filed July 18, 1972, Ser. No. 272,991
Int. Cl. B21d *1/14*
U.S. Cl. 72—457 **5 Claims**

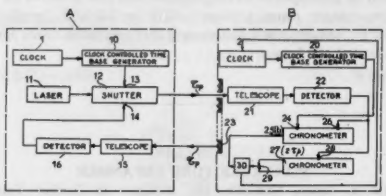


A support for a pulley or plate is vertically adjustable so that when a chain is anchored at one end to a floor and led over the pulley or plate to a vehicle, the angle of the lead of the chain can be adjustably predetermined.

ERRATUM

For Class 72—407 see:
Patent No. 3,789,689

3,789,653
SYSTEM FOR MEASURING TIME DIFFERENCES BETWEEN REMOTE CLOCKS AND FOR SYNCHRONIZING THE SAME
Hubert P. Brejaud, Sarcelles, France, assignor to Office National d'Etudes et de Recherches Aeropatiales, Chatillon, France
Filed May 30, 1972, Ser. No. 257,740
Claims priority, application France, June 8, 1971, 7120636
Int. Cl. G04b *17/12*; G04c *11/00*; H04b *9/00*
U.S. Cl. 73—6 **5 Claims**



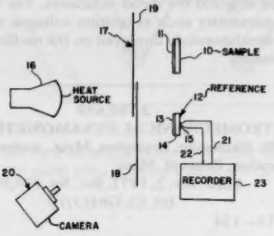
System for measuring the time difference between a master clock and a slave clock located respectively in two remote stations and synchronizing these clocks. It comprises, in the master clock station, a time base generator controlled by the master clock, a source of light, an electro-optical detector, control means depending upon the time base generator for switching on the light source and control means depending upon the electro-optical detector for switching off the light source. The slave clock station comprises a time base generator controlled by the slave clock, an electro-optical detector detecting light from the master clock station, a chronometer switched on by the time base generator and switched off by the electro-optical detector and another chronometer switched on and off respectively by the first and second output signal of the electro-optical detector. Means are provided in the slave clock station for partially receiving and partially reflecting the light to the electro-optical detector at the master clock station causing the light source to produce a luminous signal whose start and end are split by a duration equal to twice the light propagation round trip time between the two stations.

3,789,654

METHOD FOR DETERMINING THERMO-PHYSICAL PROPERTIES OF SPECIMENS

Robert A. Jones, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 18, 1972, Ser. No. 281,875
Int. Cl. G01n 25/18
U.S. Cl. 73—15 R 9 Claims



The square root of the product of thermophysical properties ρ, c and k, where ρ is density, c is specific heat and k is thermal conductivity, is determined directly on a test specimen such as a wind tunnel model. The test specimen and a reference specimen of known specific heat are positioned a given distance from a heat source. The specimens are provided with a coating, such as a phase change coating, to visually indicate that a given temperature has been reached as well as to ensure that both specimens have the same absorbtivity and thus receive the same heat rate. A shutter interposed between the heat source and the specimens is opened and a motion picture camera is actuated to provide a time record of the heating step. The temperature of the reference specimen is recorded as a function of time. The heat rate to which both the test and reference specimens have been subjected is determined from the temperature time response of the reference specimen by the conventional thin-skin calorimeter equation. This heat rate is then used to determine $\sqrt{\rho ck}$ of the test specimen from the transient one dimensional heat conduction equation for a semi-infinite solid subjected to a step heat input at a constant heat rate. A model, such as a wind tunnel model, can be tested directly thus eliminating the costly and inaccurate method of making test models solely for the purpose of determining $\sqrt{\rho ck}$.

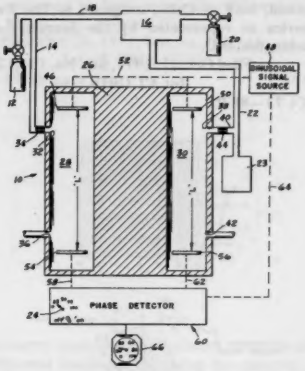
3,789,655

FLUID ANALYZER

David P. Passeri, Davenport, Iowa, assignor to The Bendix Corporation, South Bend, Ind.

Filed Mar. 20, 1972, Ser. No. 236,279
Int. Cl. G01n 29/02
U.S. Cl. 73—24 1 Claim

A rapid fluid analyzer for determining the percentage of a first fluid in a fluid mixture. A portion of the first fluid which is supplied to a mixing chamber is bled to a first chamber. The first fluid is also blended with a second fluid in the mixing chamber to form a fluid mixture. This fluid mixture is communicated to a storage chamber. A portion of the fluid mixture is bled to a second chamber. An identical energy wave is dispatched through the first fluid and the fluid mixture. A first receiver in the first chamber accepts the energy wave that passes through the first fluid. A second receiver in the second chamber accepts the energy wave that passes through the fluid mixture. The first receiver communicates a reference signal indicative of the accepted energy wave in the first fluid to an electronic detector. The second receiver likewise communicates a corresponding signal indicative of the accepted energy wave in the fluid mixture to the electronic detector. The electronic detector compares the corresponding signal with the reference signal to determine if a phase differential exists



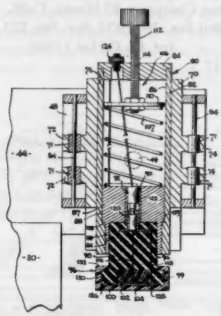
therebetween. The phase differential which is directly proportional to the percentage of the first fluid in the fluid mixture will permit instant monitoring by the analyzer.

3,789,656

RECTILINEAR ACOUSTICAL TRANSDUCER INSPECTION APPARATUS

Darrow L. Miller, Los Angeles, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed July 7, 1972, Ser. No. 269,660
Int. Cl. G01n 29/00
U.S. Cl. 73—71.5 U 13 Claims



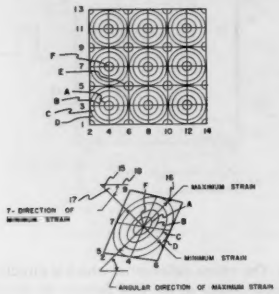
A rectilinear acoustical transducer and inspection apparatus for use as a non-destructive testing device, whereby workpieces such as structural stiffeners relating to aircraft and the like are inspected for defects or flaws. The apparatus comprises a carriage having rollers mounted therein for direct vehicular contact with the rib portion of the workpiece, whereby the carriage can transverse rectilinearly thereon and including an acoustical transducer pivotably mounted to the carriage having a locomotive means attached thereto by which the transducer is oscillated about its pivot point effecting a walking action to be imparted along the rib, thereby providing the necessary rectilinear motion throughout the length of the rib for the total rapid inspection of the workpiece. The transducer is adapted to removably receive a dry adhesive couplant, which forms a driving mechanical bond and acoustical couple between the piezo-electrical element of the transducer and the workpiece surface.

3,789,657

GRID FOR STRAIN MEASUREMENTS

Larry K. W. Ching, Jr., Littleton, and Carl E. Shafter, Englewood, both of Colo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 27, 1971, Ser. No. 193,125
Int. Cl. G01b 5/30
U.S. Cl. 73—88 R 1 Claim



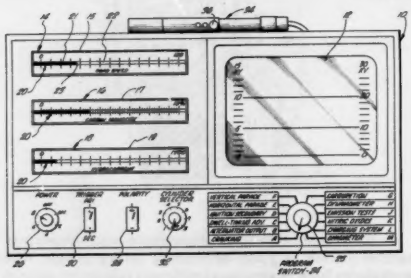
In stress analysis work a grid system may be affixed to a sheet of metal or other object that undergoes distortion or deformation due to a force being applied thereto. The present grid system of circles and squares (or rectangles) enables easy measurement of maximum and minimum strains and their respective directions and reduces computation time in stress analysis work.

3,789,658

ENGINE PERFORMANCE ANALYZER

Dick Merlin Olsen, Pasadena, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Filed Jan. 28, 1972, Ser. No. 221,613
Int. Cl. G01m 15/00
U.S. Cl. 73—117.3 28 Claims



An internal combustion engine performance analyzer is described for simultaneously displaying certain operating characteristics, such as ignition waveform, horsepower output, etc., under controlled operating conditions. A plurality of probes are coupled to the engine to provide output signals representative of engine performance characteristics such as cylinder ignition, generator output, starter current, etc.. To provide output signals representative of additional operating characteristics, a dynamometer and an exhaust analyzer may also be coupled to the engine.

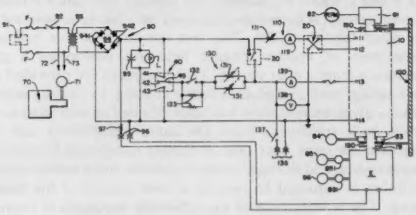
The analyzer includes an oscilloscope and at least one selectable scale test meter in which a rotatable drum positions one of six possible scales adjacent the meter indicator or pointer at a time. A multiple position program switch controls the drum position to provide the proper scale and couples selected output signals from the engine, dynamometer or exhaust analyzer to the meters and the oscilloscope for a selected test procedure. The program switch also couples one of several sweep signals to the oscilloscope so that signals, for example, representing the spark plug voltages of the cylinders may be displayed in a superimposed pattern or separated in a vertical or horizontal pattern on the oscilloscope. The program switch enables the operator to diagnosis an engine by simply rotating the switch through each of its positions and reading the values of the parameters under test on the scales positioned adjacent the meter indicators. The waveforms of a selected parameter such as ignition voltages, starter current, etc., are simultaneously displayed on the oscilloscope for each switch position.

3,789,659

ELECTROMECHANICAL DYNAMOMETER SYSTEM

Charles W. Haldeman, Lexington, Mass., assignor to Megatech Corporation, Belmont, Mass.

Filed Nov. 2, 1971, Ser. No. 194,953
Int. Cl. G01l 3/10
U.S. Cl. 73—134 11 Claims



An electromechanical dynamometer instrument system especially suitable as a laboratory and educational tool may be used selectively as engine starter motor, highly stable dynamic loader dynamometer, and electrical machine demonstrator and comprises a rotating electrical machine with a direct current power supply, field coil polarity reversing switch, armature range switch, engine speed measurement device, cylinder peak pressure measurement device, and manifold peak suction measurement device when the instrument is used with a compression type engine such as a reciprocating internal combustion engine.

3,789,660

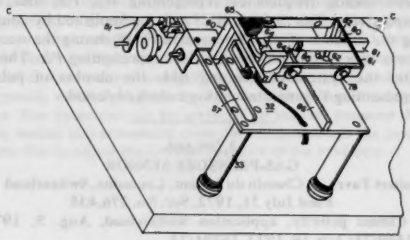
PROCESS, MACHINE AND CHART FOR TENSILE TESTING

Manuel Jesus Rubio, Bridgeport, Conn., and Victor Mario Leal, Monterrey, Nueno Leon, Mexico, assignors to Roberto Gonzalez Barrera, Vista Hermosa, Monterrey, Mexico

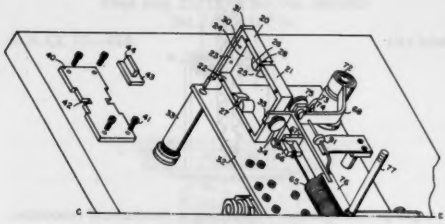
Filed Nov. 3, 1971, Ser. No. 195,313
Int. Cl. G01n 3/14, 33/10
U.S. Cl. 73—169 12 Claims

Processes of testing and a testing machine especially suited to tensile testing of dough-like materials. In the invention the test specimen is pressed into jaws whose sides do not move relative to one another but grip it because the test specimen converges at the mouths of the jaws, and while one of the jaws is fixed, the other jaw is pulled to elongate the specimen to a tension means. In the preferred embodiment the tension is applied to the specimen through the agency of a spiral spring. Force application is plotted on a chart which moves with the force application means, and a pencil or other marking means plots on the chart transverse to the direction of force application the elongation of the moving jaw. In the preferred em-

bodiment also a zig-zag motion is imparted to the line plotted in proportion to time. The invention contemplates making the



jaws into a mold by attaching a removable mold bottom, and by notches in the mold sides defining a path of a cutter so that



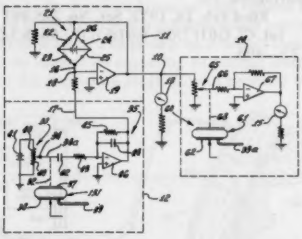
the portion of the specimen under test is the same cross section as the mouths of the jaws. The invention also includes a special chart which has isochronic zig-zags.

3,789,661

AIRCRAFT GLIDE ANGLE AND RATE OF CHANGE OF TOTAL ENERGY INDICATION MEANS

Frank M. Melsheimer, 124 Wilson St., Albany, Calif.

Filed June 25, 1970, Ser. No. 49,875
Int. Cl. G01c *21/00*
U.S. Cl. 73—178 T **11 Claims**



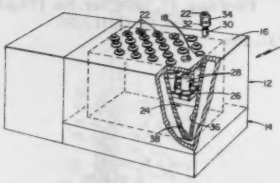
Aircraft instrumentation includes means for producing a signal indicative of the time rate of change of the kinetic and potential energy characteristic of the aircraft in flight; and other means responsive to the first means for producing an indication of the glide angle characteristic of the aircraft in flight.

3,789,662

CALORIMETRY

John F. Zettler, Ashland, and Walter A. Lazar, Needham, both of Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed Oct. 26, 1971, Ser. No. 192,111
Int. Cl. G01k *17/00*
U.S. Cl. 73—190 R **16 Claims**



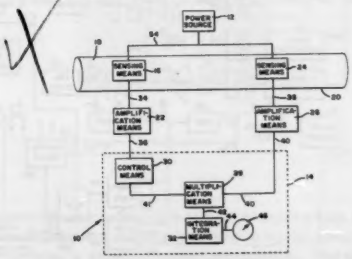
Microcalorimetry apparatus that includes structure defining a chamber, thermal insulation enclosing the chamber, and a plurality of sample support structures in the chamber. Each sample support structure includes a thermally insulated receptacle for receiving a sample to be analyzed, a sensor for sensing a sample container disposed therein and providing an output signal indicative thereof, and a temperature sensor disposed for sensing a change in temperature of the sample in the receptacle. One wall of the chamber has a plurality of spaced ports therein, each port being aligned with a corresponding sample support structure and permitting introduction and removal therethrough of a sample from the receptacle of the corresponding sample support structure. The apparatus also includes a plurality of sample container handling structures, each such structure including sealing structure for sealing a port in the wall and coupling structure for detachable connection to a sample container for inserting the sample container through the port for positioning in the receptacle with the sealing structure concurrently sealing the port. Each sample container includes a cylindrical body portion and a radially projecting cylindrical surface above the body portion which actuates the sensor when the container is disposed in the receptacle.

3,789,663

APPARATUS FOR MEASURING THE FLOW VELOCITY OF FLUID WITHIN A CONDUIT

Stephen J. Gold, 148 Fernhill Ave., Lafayette, La.

Filed May 11, 1972, Ser. No. 252,440
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 C **10 Claims**



Apparatus for measuring the flow velocity of fluid within a conduit. Sensing means external to the conduit and responsive to changes in the configuration of the conduit surface upon passage of a vortex and associated with electrical means mea-

sure the time interval during which the detectable property of the fluid passes between a plurality of preselected locations on the conduit. Fluid flow is not obstructed by installation of the sensing means. Thus, flow measurements, at a plurality of locations along the conduit can be economically obtained.

3,789,664

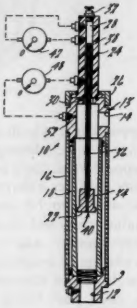
FLUID FLOW RANGE INDICATING APPARATUS

John W. Bozek, 6093 Waterfront Dr., Waterford, Mich.

Filed Aug. 27, 1971, Ser. No. 175,638

Int. Cl. G01f *1/00*

U.S. Cl. 73—209 **8 Claims**



A device utilizing a variable area flowmeter combined with a vertical concentric cylinder having a piston therein which is rigidly attached to the plummet of the variable area flowmeter. Fluid pressure upstream of the plummet is ported to the top of the piston and fluid pressure downstream from the plummet is ported to the bottom of the piston. Ports selectively placed in the cylinder wall feed pressurized fluid to indicating gauges as means of sensing the relative position of the piston, thereby indicating the flow rate range.

3,789,665

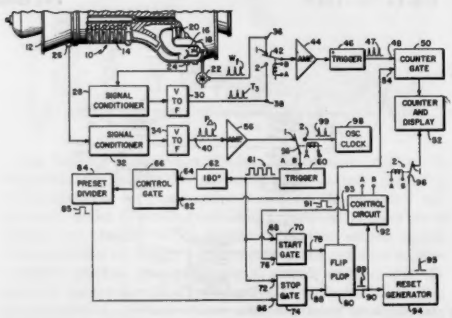
INFERRED MEASUREMENT OF THE TURBINE INLET TEMPERATURE OF A GAS TURBINE ENGINE

Rudolph Hohenberg, Trumbull, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Feb. 22, 1972, Ser. No. 227,620

Int. Cl. G01k *7/02*

U.S. Cl. 73—343 R **9 Claims**



Turbine inlet temperature of a gas turbine engine is determined by solving the equation $T_5 = C' W_f / P\Delta + T_3$, where T_5 is the gas producer turbine inlet temperature, W_f is the fuel flow, C' is essentially a constant determined by the type of fuel (but varying slowly with changes in ambient pressure), $P\Delta$ is the difference between the static pressure in the bellmouth inlet to the compressor and the ambient pressure, and T_3 is the compressor outlet temperature. T_5 is computed by developing three analog frequencies representing W_f, $P\Delta$, and T_3, respectively. The division $W_f/P\Delta$ is accomplished by counting the number of pulses generated by W_f during the occurrence of a given number of pulses representing $P\Delta$. Thereafter the system counts and adds the number of pulses representing T_3 generated during a clocked period.

3,789,666

GAS-PRESSURE SENSOR

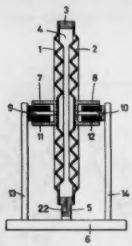
Robert Favre, 5, Chemin du Levant, Lausanne, Switzerland

Filed July 31, 1972, Ser. No. 276,435

Claims priority, application Switzerland, Aug. 5, 1971, 11580/71; July 19, 1972, 10781/72

Int. Cl. B21d *41/00*

U.S. Cl. 73—398 R **12 Claims**



A gas-pressure sensor comprising a mechanical resonator, the resonance frequency of which is closely bound to the pressure to be measured, and an oscillator controlled by the resonator. The mechanical resonator is preferably constructed of two elastic membranes joined together which oscillate in phase opposition and also enclose a hollow interior compartment which communicates with the space whose gas pressure is to be measured. Each membrane is provided with an armature and a permanent magnet of an associated transducer, the transducer includes a stationary coil which is arranged at an electrical current circuit which self-sustains the oscillations with the resonance frequency of the resonator.

3,789,667

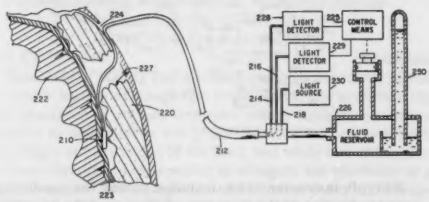
FIBER OPTIC PRESSURE DETECTOR

John H. Porter, Colchester Point, and David B. Murray, Cambridge, both of Vt., assignors to Ladd Research Industries, Inc., Burlington, Vt.

Filed Feb. 14, 1972, Ser. No. 225,881

Int. Cl. G01l *7/08*; **G01d** *5/30*; **A61b** *5/02*

U.S. Cl. 73—406 **4 Claims**



A differential sensor unit precisely monitors ambient pressure within a confined space, such as intracranial pressure of a human patient, utilizing fiber optic light guides. Three light

guides pass within a pneumatic line into a flexible envelope which is implanted in the skull. Of the external ends of the guides, one faces a light source and each of the others faces a light detector. Within the envelope the guide ends are so arranged with respect to light beam modulating mechanism responsive to envelope distortion due to change in relative pressure that motion of the mechanism relative to the internal ends varies the light transmitted from the first light guide internal end to each remaining light guide internal end, and consequently varies the light intensity sensed by each of the detectors. The detectors can be arranged to actuate pressure display means and pneumatic controls acting through the pneumatic line to adjust the internal pressure of the envelope.

3,789,668

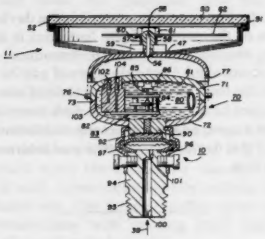
OVERLOAD PROTECTED BOURDON TUBE

Robert D. Bissell, Orange, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 23, 1972, Ser. No. 283,003

Int. Cl. G01l 7/04

U.S. Cl. 73—418 **10 Claims**



A sealed Bourdon tube responsive to externally applied pressures for effecting displacement within operating ranges correlated to the magnitude of pressure being applied. Preconditioning of the Bourdon tube includes a permanent fluid fill with an incompressible liquid of controlled volume corresponding to the decreased internal tube volume when the tube is subject to application of a predetermined overpressure. The confined fluid thereafter presets an overload limit beyond which the tube cannot subsequently be further displaced irrespective of the increasing magnitude of pressure being applied.

3,789,669

SHIRT POCKET REFRIGERATION GAUGE

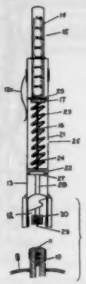
John W. Passman, Rt. 2, Immokalee Rd., Naples, Fla.

Filed June 5, 1972, Ser. No. 259,970

Int. Cl. G01l 7/16

U.S. Cl. 73—419 **5 Claims**

Briefly stated, the present invention contemplates a pocket instrument useful in a refrigerator compressor system. This instrument measures the pressure on the high and low sides or stages of the compressor by using the service valve located on the compressor. Generally speaking, the instrument has an elongated chamber, a reciprocating plunger in the chamber with an indicator with a lower end having a rod connected to said lower end. The rod in turn has a connecting boss at the lower end. In the chamber there is a reciprocating piston with



an upper socket for receiving said boss when the boss is pushed by hand into the socket. Spring means urge the piston downwards and connecting means connect the compressor to the said service valve so that when the boss engages the socket, changes in pressure are indicated on the indicator, and when said boss is not so engaged, the highest pressure will be indicated on the indicator.

3,789,670

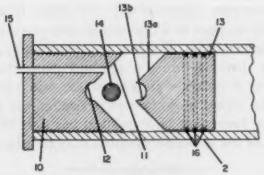
CELL FOR COLLECTING AND MIXING FLUIDS

Gary W. Rosenwald, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Aug. 2, 1972, Ser. No. 277,440

Int. Cl. G01n 1/14

U.S. Cl. 73—421 R **7 Claims**



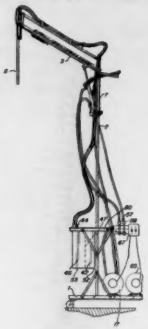
Apparatus for collecting a sample of fluids which includes a piston slidable in a cylinder displacable by the sample. A mixing element is provided within the cylinder. The piston and end wall of the cylinder are of such configuration that when the piston and end wall are in contact a small space of the proper size and shape is left to just enclose the mixing element leaving substantially no dead space within the sampling chamber.

3,789,671

PARTICULATE MATERIAL SAMPLING DEVICE

Henry B. Larson, R.R. 1, Bement, Ill.

Filed Oct. 29, 1971, Ser. No. 193,925
Int. Cl. G01n *1/14*
U.S. Cl. 73—423 R 1 Claim



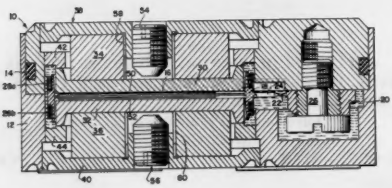
This invention is a device for removing a sample of particulate material from predetermined locations in the mass of said material.

3,789,672

ACCELEROMETER

James W. Davies, Wayne, N.J., assignor to Singer-General Precision, Inc., Little Falls, N.J.

Filed Nov. 12, 1970, Ser. No. 88,593
Int. Cl. G01p *15/08*
U.S. Cl. 73—497 2 Claims



An accelerometer wherein a proof mass is adapted for movement with respect to a coordinate axis in response to acceleration along the axis. A signal is generated in response to the movement for providing a readout proportional to acceleration, and a force is generated on said proof mass in response to the signal in a manner to realign the proof mass. The amount of force can be regulated per unit of signal, and the alignment of the movable member may be adjusted.

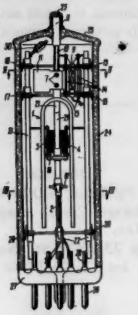
3,789,673

PICKUP OF THE ANGULAR SPEED OF A ROTATING OBJECT

German Semenovich Berlin, 5 Parkovaya ulitsa, 42, kv. 95; Dmitry Dmitrievich Shenker, Profsojuznaya ulitsa, 31, kv. 223, and Valery Germanovich Serebrenny, ulitsa akademika Koroleva, 3a, kv. 49, all of Moscow, U.S.S.R.

Filed Oct. 27, 1971, Ser. No. 192,913
Int. Cl. G01c *19/56*
U.S. Cl. 73—505 7 Claims

The essence of the invention is that the pickup of the angular speed of a rotating object includes a housing receiving therein a fork of the tuning fork kind. The pickup also comprises a device for exciting oscillation of the prongs of this fork and a device for measuring the torsional oscillation of this fork, developed upon said pickup being rotated together with the associated object about the axis of symmetry thereof, the last-mentioned device being disposed adjacent to the stem of the fork. At least one of these two devices is in the form of an electronic-mechanical transducer with a mechanically controlled electrode. For example, when it is the device for exciting oscillation of the prongs of the fork that is made in the form of the electronic-mechanical transducer, then the mechanically controlled electrode thereof can be formed by the prongs of the fork, acting as the anode of this transducer. Directly adjacent to the prongs of the fork there is mounted a winding about a core, adapted to excite oscillation of the fork, the cathode of this device being positioned intermediate of the prongs of the fork.

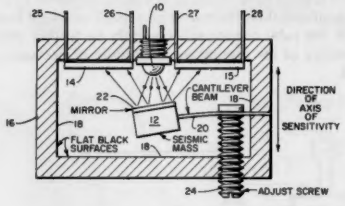


3,789,674

OPTICAL ACCELEROMETER

Matthew E. Anderson, and James E. Means, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 27, 1972, Ser. No. 301,541
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 R 9 Claims



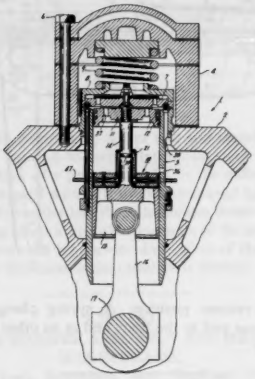
A miniature device including a light source, a suspended mass, and a photocell system is employed as an optical accelerometer which serves as a transducer to provide an electrical signal proportional to the magnitude of acceleration and converts inertial forces into an electrical signal.

3,789,675

GAS COMPRESSOR HAVING ROLLING TYPE SEALING DIAPHRAGM

Erich J. Kocher, Milwaukee, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed May 30, 1972, Ser. No. 257,662
Int. Cl. F01b *19/00*
U.S. Cl. 74—18.2 1 Claim



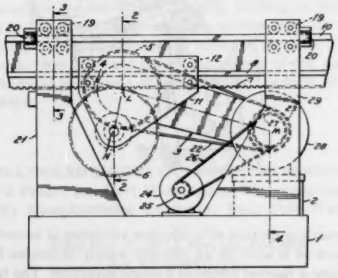
Oil leakage from the crankcase into the compression chamber of a reciprocating gas compressor is positively prevented by a rolling diaphragm within the compression cylinder. A fixed mounting ring for the diaphragm surrounds a piston rod within the cylinder, and a flexible hollow sealing sleeve has a radially inner connection with the piston rod and a radially outer connection with the mounting ring. During axial movement of the piston rod the sealing sleeve rolls at one side of its connections with the mounting ring and piston rod radially inward upon the latter and simultaneously, at the other side of said connections, it rolls radially outward away from the piston rod. The interior hollow space of the sealing sleeve communicates with cooling fluid inlet and outlet openings in the axial cylinder wall.

3,789,676

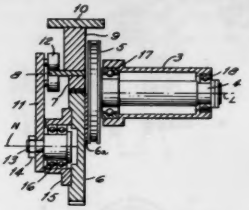
RECIPROCATING DRIVE MECHANISM

John Henry Brems, 32867 White Oaks Tr., Birmingham, Mich.

Continuation-in-part of Ser. No. 80,841, Oct. 15, 1970, abandoned. This application June 15, 1972, Ser. No. 262,957
Int. Cl. F16h *21/02*
U.S. Cl. 74—27 22 Claims



An apparatus for transmitting rotary motion to an output motion with predetermined acceleration and velocity which includes an output member such as a lineally movable or rotary rack driven by a rotary member drivingly associated therewith, the rotary member being mounted for movement in a path generally parallel to the output member rotating about a first axis and driven by a connected rotative member



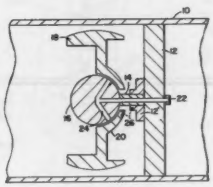
mounted on a second axis spaced from the first axis to move in a path generally transverse of the direction of movement of the output member with means to control the relative positions of the output member and the rotary member to maintain the driving relationship and means to guide the rotative member in the path of movement transverse to output motion.

3,789,677

POLARIZED AIR BEARING ASSEMBLY

William W. Stripling, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 19, 1972, Ser. No. 290,289
Int. Cl. G01c *19/20*
U.S. Cl. 74—5.7 2 Claims



A bearing assembly for use in supporting a gyro rotor in a missile during flight in a missile trajectory. During acceleration the outer bearing support is supported by a mounting plate. Air under pressure is utilized to provide an air bearing film to support a hemispherical outer bearing support of the rotor for rotation around the stator during deceleration. A pin secures the rotor in place during shipment or storage and is sheared during missile acceleration.

3,789,678

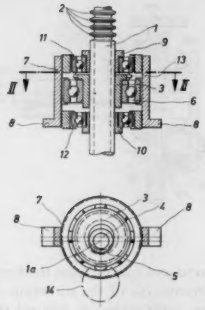
SCREW DRIVE MEANS USING AUXILIARY MESHING ROLLERS

Robert Gartner, Freherr von Stein Strasse 8, Butzbach/Hessen, Germany

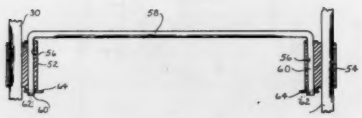
Filed July 26, 1972, Ser. No. 275,146
Claims priority, application Germany, July 28, 1971, P 21 37 636.3
Int. Cl. F16h *27/02*
U.S. Cl. 74—89 9 Claims

A means for mechanically moving a spindle in a longitudinal direction by operating one or a plurality of meshing rollers positioned around the spindle axis. In one form the spindle is

formed with annular grooves and the rollers are threaded. In a second form the spindle is threaded and the rollers are formed with annular grooves. Since the rollers are free to rotate, this type of transmission has less friction than the usual bolt and nut combination.



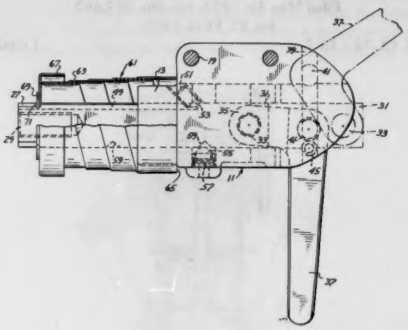
3,789,679
PUMPING UNIT SAFETY GUARD
Virgil H. Westbrook, P.O. Box 2264, Hobbs, N. Mex.
Filed Apr. 12, 1973, Ser. No. 343,929
Int. Cl. F16h *21/32*
U.S. Cl. 74—41 **3 Claims**



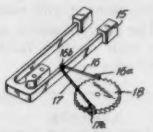
A brace bar is placed between pitmans of a pump jack to maintain the crossbeam in proper position in the event one of the wrist pins holding one of the pitmans to the crank arm comes loose.

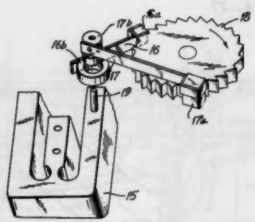
3,789,680
CAM PIN PLUNGER CLAMP
Leland F. Blatt, 31915 Groesbeck Hwy., Fraser, Mich.
Continuation-in-part of Ser. No. 284,409, Aug. 28, 1972. This application Jan. 26, 1973, Ser. No. 326,797
Int. Cl. F16h *21/44*
U.S. Cl. 74—102 **5 Claims**

A cam pin plunger clamp has a body mountable on a support having a first longitudinal bore of a polygonal cross section and a second intersecting bore defining internal handle guide walls. Opposed cam guide slots are formed in said walls and are adapted to guidably receive the ends of a cam pin projected through the handle. The handle is nested within the body and at one end is pivotally connected to the plunger whereby, on pivotal movements of the handle with respect to the body, the plunger is projected and alternately retracted therein. A spring biased detent retainingly engages the plunger in retracted release position. A spring plunger cover is anchored at one end to the body and at its other end secured to the plunger.



3,789,681
APPARATUS FOR TRANSFORMING RECIPROCATING MOTION INTO UNIDIRECTIONAL ROTATION
Hiromitsu Mitsui; Kenichi Koike, both of Suwa-Gun, and Yoshikazu Kawamura, Suwa-Shi, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Apr. 6, 1971, Ser. No. 131,747
Int. Cl. 74 *575*
U.S. Cl. 74—143 **7 Claims**





Reciprocating motion of a vibrator vibrating at several tens of Hz, such as is used in an electric watch, activates fingers which rotate a ratchet wheel in a single direction. The linkage between the vibrator and the wheel is such that the wheel is advanced during both halves of each cycle of vibration. The fingers can be driven either by one or by both arms of the vibrator.

3,789,682

CROWN-SHAPED PULLEY LAGGING

William G. Holz, 207 W. Vine St., Lodi, Calif.

Filed Mar. 27, 1972, Ser. No. 238,185
Int. Cl. F16h 55/48
U.S. Cl. 74—230.7 5 Claims

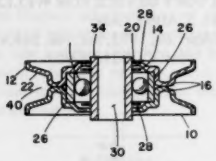
Pulley lagging comprising center and end members formed for mounting in end-to-end relation on and across the peripheral surface of a pulley parallel to the pulley axis. The members are formed with belt traction material having a constant thickness over the length of the center member and having an equal thickness at the abutting ends of the end members but tapering over the lengthwise dimension of the end members to a lesser thickness at the outer ends thereof.

3,789,683

ROTATABLE MEMBER ASSEMBLY AND METHOD FOR MAKING SAME

Charles C. Frost, Kentwood, and Siegfried Weis, Grand Rapids, both of Mich., assignors to C. L. Frost & Son Inc., Grand Rapids, Mich.

Filed Nov. 18, 1971, Ser. No. 199,983
Int. Cl. F16h 55/34
U.S. Cl. 74—230.8 7 Claims



The present invention relates to a rotatable member assembly such as a pulley wheel, a sheave or drive pulley or the like fabricated from a pair of metal disks stamped from sheet metal stock and welded together in a novel manner. The disk members are each provided with an outer peripheral rim, a web portion having an annular laterally extending weld projection formed thereon, and a central hub-engaging section. To assembled the member, a bearing, bushing, or hub is positioned in the central hub-engaging section and the disks are placed together and subjected to heat and pressure at the web portion so that the weld projection of one of the disks fuses with the weld projection of the other disk to form an integral assembly.

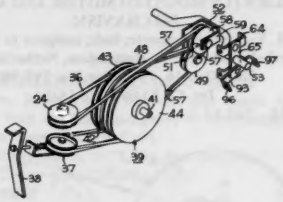
3,789,684

AIR COOLED SHUTTLE CLUTCH TRANSMISSION

Edward Freier, Jr., Port Washington, Wis., assignor to Simplicity Manufacturing Company, Inc., Port Washington, Wis.

Filed Nov. 7, 1972, Ser. No. 304,498
Int. Cl. F16h 55/22
U.S. Cl. 74—230.17 D 1 Claim

A cooling arrangement for a V-belt clutching and reversing transmission including a central pulley section flanked by pulleys on either side and wherein said flanking pulleys are provided with fan elements for moving air axially towards said central pulley section and the latter is provided with ribs for moving such air radially outward toward the periphery of said central pulley section for cooling such central pulley section, such flanking pulleys and the V-belts connected therewith.

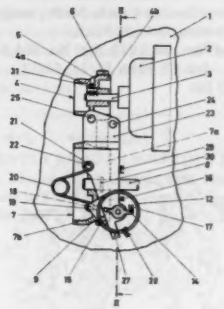


3,789,685

VARIABLE-SPEED BELT GEAR

Fritz Krumbein, Stuttgart-Mohringen, Germany, assignor to Robert Bosch Photokino GmbH, Stuttgart, Germany

Filed June 28, 1972, Ser. No. 267,173
Claims priority, application Germany, July 7, 1971, 2133691
Int. Cl. F16h 7/08
U.S. Cl. 74—242.3 11 Claims



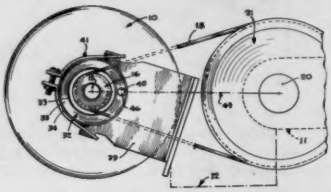
A belt gear wherein a first two-step pulley receives torque from a motor and drives a second two-step pulley by way of an endless belt. The mechanism for changing the speed of the second pulley has a selector knob which is rotatable between first and second angular positions and is coaxial with a shifter lever having a fork which straddles a portion of the belt between the two pulleys. One leg of a torsion spring is coupled to an eccentric pin of the knob and the other leg of the torsion spring is coupled to the shifter lever. The spring biases the knob to the second angular position as soon as the knob is rotated, either by hand or by remote control, beyond an intermediate dead-center position on its way from the first angular position, and vice versa. In the first angular position of the knob, the spring biases the shifter lever toward a position in which the lever tends to maintain the belt in engagement with the larger rim portion of one of the pulleys and the smaller rim portion of the other pulley. In the second angular position of the knob, the spring tends to move the shifter lever to a position in which the belt is trained over the smaller rim portion of the one pulley and the larger rim portion of the other pulley. The spring is capable of shifting the belt by way of the lever only when the belt is driven by the first pulley.

3,789,686

DEVICE FOR MAINTAINING A CONSTANT CENTER DISTANCE BETWEEN THE OUTPUT SHAFT OF A RESILIENTLY MOUNTED MOTOR AND A DRIVEN MECHANISM

Francis H. Vogelsang, Laporte, Ind., assignor to Maatschappij Van Berkel's Patent N.V., Rottendam, Netherlands

Filed Oct. 16, 1972, Ser. No. 297,983
Int. Cl. F16h 7/10, 55/14
U.S. Cl. 74—242.13 A 18 Claims



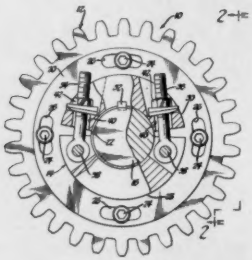
The device of the invention maintains constant spacing between the centers of an output shaft of a resiliently mounted motor and the input shaft of a mechanism that is drivingly connected to the output shaft by a transmission assembly where the transmission assembly exerts a force along a line extending through the shaft centers.

3,789,687

SPROCKET ASSEMBLY

Delbert M. Cutter, Swartz Creek, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1972, Ser. No. 308,240
Int. Cl. F16h 55/12, 55/52
U.S. Cl. 74—243 DR 2 Claims



A sprocket assembly having a two-piece hub supporting a sprocket wheel on a shaft. One part of the hub is circumferentially spaced from the other and both hub parts are interconnected by a pair of threaded studs each of which is pivotally supported at one end and carries a nut at the other end for adjusting the angular position of the sprocket wheel relative to the shaft.

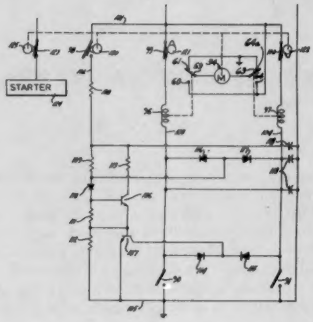
3,789,688

INTERRELATED SHIFT, STARTER AND CLUTCH CONTROLS

Floyd M. Minks, Rt. 1, Box 41, Kissimmee, Fla.

Filed Jan. 18, 1971, Ser. No. 107,050
Int. Cl. B60k 29/00, 23/02, 23/04
U.S. Cl. 74—365 15 Claims

A marine engine is coupled to a propeller by a clutch unit and a shift unit. A d.c. permanent magnet motor is coupled to the shift unit and the clutch unit. The motor is energized in a servo loop to selectively establish a forward drive, a reverse drive, or a neutral shift position. The motor is connected to the power supply through a pair of relays to ground both sides and to selectively connect one side to the power supply. A forward relay line is opened by a motor operated cam switch responsive to a full shift position. The reverse relay line is



similarly controlled. A neutral line is connected to both of the cam switches and includes a similar cam switch which is actuated in the neutral position.

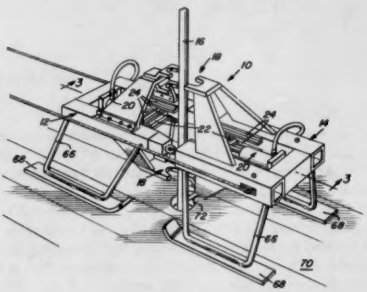
A three-position selection switch connects power to the several relay lines and the neutral line. An electronic interlock circuit interconnects the neutral line to the forward and reverse relay lines.

3,789,689

SHUTOFF DEVICE FOR WELLS

Orville F. Mace, Rt. 3, Afton, Okla.

Filed Apr. 20, 1972, Ser. No. 245,955
Int. Cl. B21d 22/04
U.S. Cl. 72—407 19 Claims



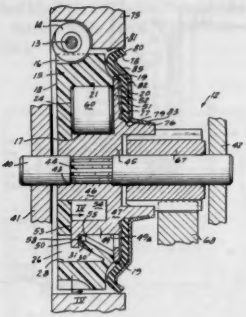
A device for shutting-off well drilling and pipe strings and the like has a pair of opposed frame members arranged with a string between them and displaceable with respect to one another. Two pairs of jaws are mounted on the frame members for guidingly engaging the string when the frame members are displaced toward one another. Each frame member is provided with a fluid motor having an I-beam mounted on the piston thereof and arranged for movement with respect to the I-beam of the opposed frame member. These I-beams move relatively to the respective frame member for flattening a portion of the string to shut off same. Locking devices are provided on the frame members for locking themselves together after displacement toward one another, thus preventing the frame members from moving away from one another while the string is being flattened by the fluid motors and I-beams.

3,789,690

OVERLOAD RELEASE DEVICE FOR A MOTOR DRIVE

Donald J. Droske, Monroe, Mich., assignor to Dura Corporation, Southfield, Mich.

Filed Nov. 17, 1972, Ser. No. 307,617
Int. Cl. F16h 57/00, 1/16; F16d 3/14
U.S. Cl. 74—411 26 Claims



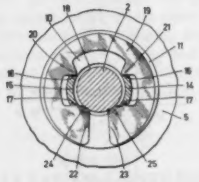
An overload release device for an electric motor drive of the type wherein a driving gear is connected to a driven gear through an overload release having compressible cylinders received in a cavity in the driving gear and contacting adjoining lands on a hub member has the hub member formed as an integral die casting around a knurled or splined portion of the pin or shaft. The assembly has a resilient washer forming a primary seal with a raised axial ridge on a flange of the hub and a secondary lip peripheral seal against an adjoining housing wall. A plastic driving gear has a plurality of inwardly directed angular resilient tongues which snap over abutment lands on the hub to limit axial separation of the driving and driven gears with respect to one another. Further, the tongues are wider than the abutment lands and provide radial walls engageable with the abutment lands to limit angular movement between the hub and the driving gear.

3,789,691

FRICTIONAL COUPLING DEVICE FOR WATCH MOVEMENT

Roland Zaugg, Grenchen, Switzerland, assignor to A. Schild S.A., Grenchen (Canton of Soleure), Switzerland

Filed July 12, 1972, Ser. No. 271,131
Claims priority, application Switzerland, July 12, 1971, 10225/71
Int. Cl. F16h 55/00; F16d 7/02
U.S. Cl. 74—432 8 Claims



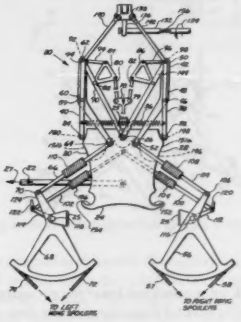
A frictional coupling device for two rotating, coaxial components of a watch movement comprising an arbor, a pinion on that arbor which is freely engaged and which is provided with two gripping elements located on either side of the arbor, and a connecting member that is elastically deformable. The connecting member fits around the arbor and the two gripping elements of the pinion. The connecting member presses against the arbor and becomes frictionally interlocked with the arbor such that when the arbor rotates, the connecting member rotates and causes the encompassed pinion to also rotate.

3,789,692

SPOILER CONTROLLING MIXER

Alton E. Farr, Rolling Hills Estates, and Lorin A. Wood, Lakewood, both of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed May 4, 1972, Ser. No. 250,116
Int. Cl. G05g 1/00
U.S. Cl. 74—480 R 10 Claims



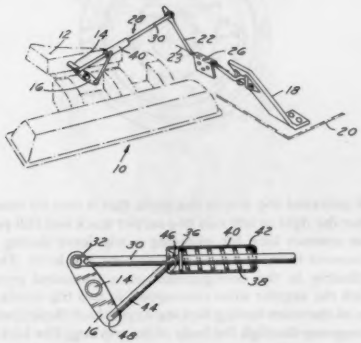
A mechanical mixer for producing a spoiler controlling output by predeterminately combining lateral, speed brake, ground spoiler and direct lift control inputs. The mixer accomplishes this through the use of cams, followers, summing linkage, and override devices.

3,789,693

RESILIENTLY BIASED CONTROL LINKAGE

John R. Baker, Livonia, and George Fox, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

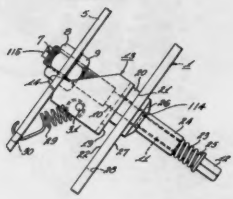
Filed July 17, 1972, Ser. No. 272,505
Int. Cl. G05g 1/14
U.S. Cl. 74—513 7 Claims



A control linkage or mechanism suitable for interconnecting a motor vehicle carburetor throttle and an accelerator

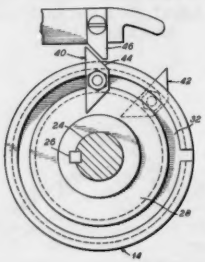
pedal. The linkage includes a throttle lever, an accelerator lever and a connecting link joining the levers. A compression spring and a second link cooperate with the throttle lever and the connecting link to resiliently urge the throttle lever toward a closed position without the need for reaction brackets or spring connections external to the linkage.

3,789,694
FRICTION BLOCK FOR LEVER
Robert C. Haupt, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Jan. 2, 1973, Ser. No. 320,293
Int. Cl. G05g *5/06*
U.S. Cl. 74—531 **6 Claims**



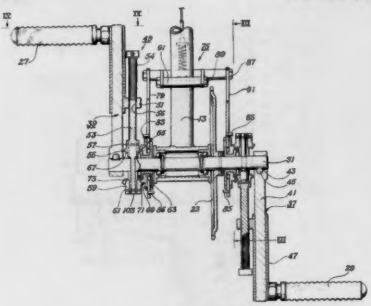
A friction lock on a quadrant lever for providing heavy frictional resistance to pivotal movement in the first direction and light frictional resistance to pivotal movement in the second direction.

3,789,695
LEFT AND RIGHT TRIP DOGS FOR CARRIER TRACKS
Clarence Anderson, 7813 W. Carmen Ave., Chicago, Ill.
Filed July 3, 1972, Ser. No. 268,715
Int. Cl. F16h *53/00*
U.S. Cl. 74—568 R **9 Claims**



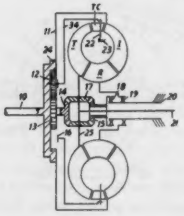
A universal trip dog in the sense that it may be mounted to either the right or left side of a carrier track and still position a lever contact face for engaging a trip lever during relative movement between the carrier and the trip lever. The dog is preferably in the configuration of a truncated pyramid in which the angular sides correspond to two trip contact faces, one of the sides having locking keys which flank a mounting passageway through the body of the trip dog. The locking keys have top and bottom rectilinear sides so that such keys can be inserted into a track or groove which is either on the right or left side of a carrier. The same side of the trip dog is abutted against the carrier, but said trip dog is simply rotated 180° so that one contact face is always correctly oriented for actuating a trip lever during relative movement.

3,789,696
PEDAL EXTENDERS FOR BICYCLE
William S. Beam, III, P.O. Box 14, Haslet, Tex.
Filed Jan. 10, 1973, Ser. No. 322,527
Int. Cl. B62m *3/02*
U.S. Cl. 74—594.1 **6 Claims**



An improvement in pedal extenders for bicycles or the like characterized by a pair of extensible crank arms having an outer portion carrying the pedal and movable longitudinally of an inner portion; radially extending screws and nuts connected with respective outer portions for moving them in the appropriate direction; first and second gears for effecting rotation of the screws in respective directions; respective sets of idler gears and sprockets that normally rotate with the crank arms during pedaling of the bicycle; and a positive engaging means for positively engaging a respective set of idler gears and sprockets to stop rotation thereof for effecting movement of the pedals and the outer portions in a respective direction radially. The positive engaging means has a handle movable in two directions with respect to its neutral position for moving the pedals radially; for example, inwardly for greater speed or outwardly for delivering greater torque to the powered wheel of the bicycle. The specific details of the apparatus are also disclosed.

3,789,697
TORQUE CONVERTERS
Howard Frederick Hobbs, Rose Cottage Pillory Green, Napton, Rugby, England
Filed May 8, 1972, Ser. No. 251,375
Claims priority, application Great Britain, May 19, 1971, 15812/71
Int. Cl. F16h *47/00*
U.S. Cl. 74—677 **6 Claims**



The invention comprises a torque converter coupling having an input impeller, an output turbine, a power circulatory turbine, a first gearing connecting the circulatory turbine with the impeller and input shaft and the second gearing connecting the first gearing with the output shaft and a stationary part so that the circulatory turbine rotates at a speed less than that

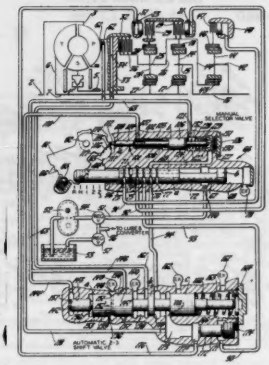
of the impeller at low output speeds and greater than that of the impeller at higher output speeds.

3,789,698

AUTOMATIC SHIFT FOR A TRANSMISSION

Richard H. Williams, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 12, 1972, Ser. No. 252,858
Int. Cl. B60k *21/00*; F16h *3/74*
U.S. Cl. 74—752 C **9 Claims**



The transmission shown has a gear set providing three forward ratio drives and a reverse drive each established by a fluid motor operated friction device, a brake or clutch. The power shift control system has a manual selector valve operative to connect main line fluid pressure in reverse position to a reverse brake line to establish reverse, in first position to a first ratio drive brake line to establish low drive, in second position to a manual second ratio drive feed line connected to a shuttle valve and in second third position to a second-third ratio drive feed line connected to an input governor controlled automatic second-third shift valve. On a first-second manual valve shift or a third-second manual valve shift, when permitted by the inhibitor, the second drive feed pressure moves the shuttle valve and feeds the second brake line to engage second ratio drive. The manual valve in second-third position provides the second-third feed pressure which is connected by the downshifted automatic shift valve to an automatic second feed line to act on the shuttle valve to feed the second brake line to establish second drive and by the input speed upshifted automatic shift valve to the third drive clutch line to establish high drive. The inhibitor permits upshifts but prevents manual valve downshifts at speeds which would cause excessive input speeds after the downshift. Downshifting from the second-third position to second position is inhibited while the automatic valve is upshifted. The inhibitor is directly controlled by governor pressure to inhibit second position to first position downshifts.

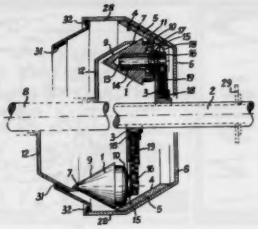
3,789,699

INFINITELY VARIABLE-SPEED FRICTION TRANSMISSION

Louis Guichard, 10 Impasse Henri Bouchard 21, Dijon, France

Filed Mar. 10, 1972, Ser. No. 233,701
Claims priority, application France, Mar. 11, 1971, 7108449
Int. Cl. F16h *15/50*, *55/32*
U.S. Cl. 74—796 **11 Claims**

This transmission mechanism adapted to provide an infinitely variable range of reduction ratios comprises radially supported tapered rollers of elongated configuration comprising on one side a relatively large driven cone having a rectilinear generatrix and a moderate inclination, adapted to roll inside a driven race also of tapered configuration and moderate width, and on the other side a very narrow bearing cone adapted to roll inside a tapered bearing race of greater



width, having a rectilinear generatrix and a moderate inclination.

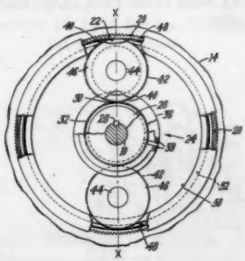
The contact pressure between the rollers and races, which is necessary for transmitting the torques, is obtained through the combined actions of the centrifugal forces generated by the rotation of said rollers about the main axis of the device, by self-clamping devices responsive to the driving torques and by radial thrust spring each acting upon a separate roller.

3,789,700

POSITIVE DRIVE ROLLER PLANETARY WAVE GENERATOR

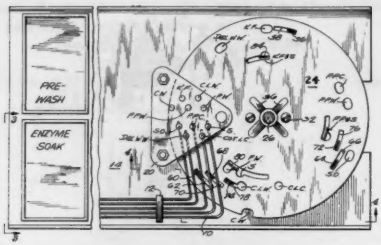
Alex P. Cotreau, Burlington, and John F. Jacobs, North Billerica, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed Apr. 4, 1972, Ser. No. 240,979
Int. Cl. F16h *37/00*, *1/28*
U.S. Cl. 74—801 **5 Claims**



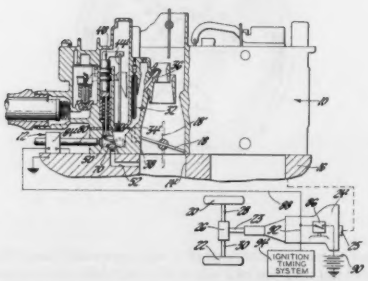
In harmonic drive actuators a wave generator imparts circumferential rotation of a wave of radial deflection to a wave carrying member often termed a strain gear. The present planetary wave generator transmits such motion positively to provide constant speed ratio, and affords an economic planetary roller structure insuring good bearing life. The usage of ball-bearings is omitted, and tendency to skewing is minimized.

3,789,701
TIMER POSITIONING MECHANISM
Albert F. Ditzig, Hoffman Estates, Ill., assignor to Controls Company of America, Schiller Park, Ill.
Filed Nov. 16, 1972, Ser. No. 307,179
Int. Cl. F16h *35/18*
U.S. Cl. 74—813 R **10 Claims**



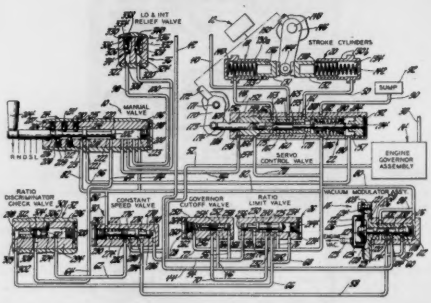
When a cycle selection button is depressed, it causes a selected wire to be torsionally stressed to cause the selected pin to be biased downwardly against the surface of the rotary disc. The disc is carried by the timer shaft which is moved outwardly during the selection/positioning operation. The disc has various radially and circumferentially positioned holes into one of which a selected pin may drop to thereby correctly position the timer at the start of the selected cycle. Three holes are provided in the disc on the radius of the "soak" pin and a masking arrangement covers or uncovers, as the case may be, the "soak" holes so only that hole which properly combines with the selected cycle is operative. The masking arrangement is actuated by one of the possible cycle pins. Therefore, a "soak" period may be selected to precede any of a number of cycles while employing only one "soak" button and one "soak" pin.

3,789,702
VACUUM CONTROL FOR CARBURETOR POWER ENRICHMENT APPARATUS
Robert T. Price, Berkley, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 15, 1972, Ser. No. 234,897
Int. Cl. B60k *21/00*; **F02b** *33/00*; **F02m** *7/00*
U.S. Cl. 74—859 **3 Claims**



A solenoid valve is normally opened to bleed a part of the engine vacuum applied to operate the power enrichment system of an internal combustion engine carburetor. A transmission controlled switch closes the solenoid valve when the transmission shifts to a high drive ratio from a lower drive ratio. Since the power system varies the flow of enriched fuel inversely with engine vacuum, closure of the valve delays the commencement of fuel enrichment until the engine vacuum falls below a level lower than that at which enrichment is normally commenced with the valve open.

3,789,703
HYDRAULIC CONTROL SYSTEM
Carl E. Shellman, Livonia, and Nils P. Week, Allen Park, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 2, 1972, Ser. No. 294,085
Int. Cl. B60k *21/00*
U.S. Cl. 74—860 **7 Claims**

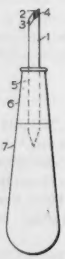


The drawings illustrate an improved, simplified hydraulic control system for use with a continuously variable drive ratio transmission, the system being responsive to engine governor pressure and engine vacuum to provide constant speed or part-throttle operation and full-throttle operation, the latter producing results comparable to the speed rise curve obtained in a transmission embodying a hydrokinetic torque converter.

ERRATUM

For Class 74—491 see:
Patent No. 3,789,645

3,789,704
MEZZOTINT ROCKER
Andy B. Noestheden, 817 Chatham St. East, Windsor, Ontario, Canada
Filed Apr. 28, 1972, Ser. No. 248,458
Int. Cl. B41b *1/06*
U.S. Cl. 81—9.2 **4 Claims**



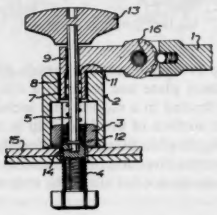
This invention consists of a mezzotint rocker which is used in fine art etching and engraving for rendering black or gray

areas. It differs from the existing old style rocker in that its cutting teeth are cut on a beveled surface which is at an angle to the face of the rocker, rather than on a surface which is at rightangles to the face of the rocker as is the case in rockers used prior to this invention.

3,789,705
TOOL FOR MOUNTING AND DISMOUNTING A BOLTED UNION

Bengt Roland Naslund, Snappvagen 16, 190 60 Balsta, Sweden

Filed Mar. 24, 1972, Ser. No. 237,624
Claims priority, application Sweden, Mar. 29, 1971, 4017/71
Int. Cl. B25b *23/08*
U.S. Cl. 81—13 **3 Claims**



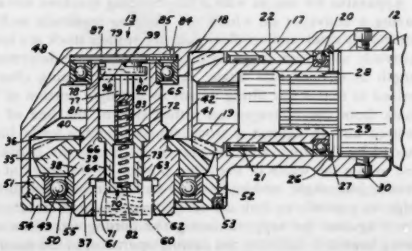
A tool for mounting and dismounting a bolted union comprising a nut and a bolt consists of a spanner which serves to screw the nut onto the bolt and unscrew it therefrom, and of a pin of unround cross section mounted for rotation in the spanner and adapted to engage in a central bore of conforming cross section formed in the free bolt end which cooperates with the nut. The pin mounted for rotation in the spanner and having unround cross section is longitudinally movable within broad limits in the spanner and the pin which has a handle for permitting rotation thereof in relation to the spanner cooperates with a spring mechanism which tends to urge the pin downwards to the position to be occupied by the nut in the spanner.

A bolt which is for use in the bolted union and adapted to be operated by the tool has a central hexagon bore formed in its free end.

3,789,706
NUT COLLECTING AND RETAINING SOCKET FOR POWER TOOLS

William Stephens Smith, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed June 26, 1972, Ser. No. 266,171
Int. Cl. B25b *21/00*
U.S. Cl. 81—57.29 **10 Claims**

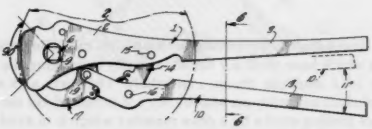


A nut socket attachment for a power driven nut fastener. An elongated housing encloses a central drive operably attachable to the output of a powered nut fastener. A wrench socket is rotatably driven by the central drive and includes a hexagonal socket recess in which to collect and retain a received nut. Spring biased to project axially inward of the socket recess, is a peripherally threaded relatively stationary cylindrical nut collecting and retaining member. Rotating the socket initially in a reverse direction draws or collects the received nut onto the retainer inwardly of the socket. Subsequently, rotating the socket in a forward direction forces the collected nut off the retainer outwardly of the socket onto its fastening bolt or stud.

3,789,707
TWO SPEED WRENCH

James R. Belknap, 1188 Coast Village Rd., Santa Barbara, Calif.

Filed Oct. 24, 1972, Ser. No. 299,762
Int. Cl. B25b *13/46*
U.S. Cl. 81—57.39 **7 Claims**

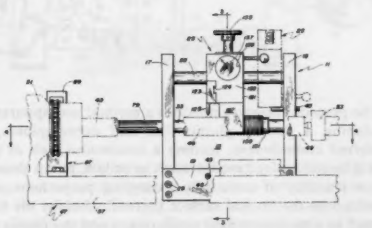


A wrench having a first handle in which a rotatable drive member surrounded by a drive ratchet is journalled, and a second handle is pivotally connected to the first handle. A linkage assembly including a drive pawl connects the second handle to the ratchet so as to cause rotation of the drive member at a faster rate than the rate of pivotal movement of the second handle relative to the first handle. The linkage also connects the second handle to the drive member so as to lock the drive member with respect to the first handle, when the second handle is held in fixed relation to the first handle, so that the two handles and drive member may be turned in unison.

3,789,708
THREAD CUTTING DEVICE

Peter H. Schwarzbach, San Pablo, and Robert L. Perrin, Martinez, both of Calif., assignors to Ernest H. McCoy, Berkeley, Calif., a part interest

Filed Oct. 18, 1971, Ser. No. 189,934
Int. Cl. B23b *5/46*
U.S. Cl. 82—5.5 **7 Claims**



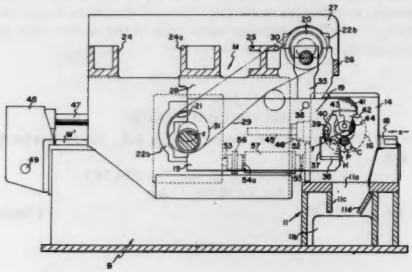
A thread cutting device for attachment to a lathe comprising a frame supporting a rotatable and slidable head and means for moving the head with controlled movement along a workpiece mounted in the lathe. The head includes a cutting tool which can be rotated into and out of engagement with the workpiece for forming threads thereon.

3,789,709

ORBITAL CRANKSHAFT LATHE

George A. Kendall, and Donald E. Roseberry, both of Saginaw, Mich., assignors to The Wickes Corporation, Saginaw, Mich.

Filed May 22, 1972, Ser. No. 255,445
Int. Cl. B23b 5/18
U.S. Cl. 82—9 7 Claims



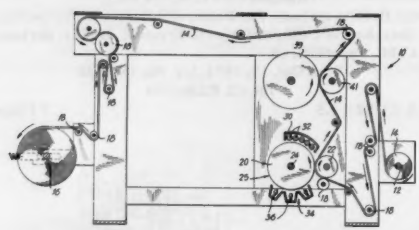
A crankshaft lathe having orbiting girts mounting tool holders which have tools for simultaneously machining the crank pins of a multiple throw crankshaft. The girts and master crankshaft assembly on which they are mounted are moved in a tool feeding stroke by a draw member which is in axial alignment with the resultant horizontal component of thrust exerted by the tools on the workpiece. Moreover, the ways, on which the master crankshaft and tool girt assembly move, are substantially in alignment with this resultant force component, the ways being split to accommodate the lower master crankshaft between them and permit this.

3,789,710

METHOD AND APPARATUS FOR PRODUCING A POROUS PLASTIC FILM

Paul Silverstein, Creve Coeur, Mo., assignor to Applied Synthetics Corp., Washington Park, E. St. Louis, Ill.

Filed Sept. 10, 1971, Ser. No. 179,478
Int. Cl. B26f 1/24, 3/08
U.S. Cl. 83—16 19 Claims



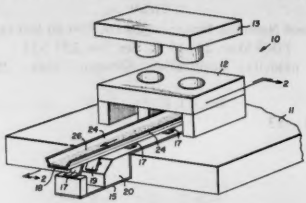
The present invention provides a method and apparatus for producing a porous plastic film and contemplates, in a preferred embodiment, feeding a continuous web of plastic film material by feed means, such as rollers, past a drum having a plurality of outwardly extending projections or tips mounted on the eternal surface thereof, whereby the tips are heated to a predetermined temperature and the plastic film is brought in contact with said tips to cause minute, microscopic reinforced apertures to be burned in said plastic film to form pores or apertures therein. Thereafter, if necessary, the tips are then heated to a higher temperature to burn off any residue of plastic material remaining thereon and then cooled to the desired predetermined temperature before again being brought into contact with the continuously fed plastic film.

3,789,711

PUNCH PRESS DISCHARGE FEEDER

Dennis E. Mead, Cazenovia, N.Y., assignor to Lipe Rollway Corporation, Liverpool, N.Y.

Continuation-in-part of Ser. No. 136,386, April 22, 1971, abandoned. This application Nov. 14, 1972, Ser. No. 306,292
Int. Cl. B26d 5/26
U.S. Cl. 83—61 10 Claims



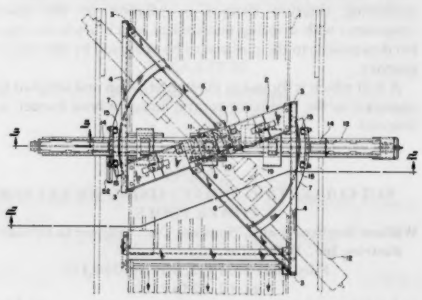
A feed strip extends under the female die of a punch press above the bolster plate and leads to a discharge region. The feed strip is vibrated in a motion that includes a rise and fall, and the upper surface of the feed strip is covered with a pile material having flexible filaments uniformly inclined from the vertical toward the direction of feed so that objects discharged from the female die are fed along the strip to the discharge region.

3,789,712

APPARATUS FOR SEVERING TIRE PLY STOCK AND THE LIKE

George E. Enders, Salem, Ohio, assignor to NRM Corporation, Cleveland, Ohio

Filed Oct. 16, 1972, Ser. No. 298,021
Int. Cl. B26d 7/10
U.S. Cl. 83—171 8 Claims



Apparatus for use as with a tire building machine servicer having a conveyor on which tire building materials such as corded ply stock and cordless gum ply or liner stock are intermittently advanced lengthwise for cutting to predetermined length at desired bias angle, said apparatus being characterized in that it has lifting means for lifting a portion of the stock from the conveyor on either side of the line of the desired cut up against a stock support, and a knife blade guided by the apparatus for movement above the conveyor and across the width of the lifted portion of the stock at the desired bias angle, said knife blade having an inclined cutting edge to provide an upward force component to retain the stock against the support during the cutting operation and being heated to facilitate the cutting operation of the uncured rubber-like material of cordless gum liner stock or of the uncured rubber-like material between adjacent cords of corded ply stock. In the case of cutting of corded ply stock, the knife

blade is additionally vibrated to facilitate the finding of the desired cut line between adjacent cords thereof.

3,789,713

APPARATUS FOR SLITTING SEAMLESS FLATTENED TUBES OF PLASTICS FILM

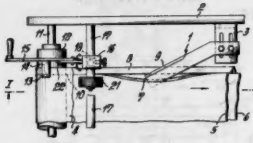
Rudolf Peters, Lengerich of Westphalia, Germany, assignor to Windmolter & Holscher, Lengerich of Westphalia, Germany

Filed May 30, 1972, Ser. No. 257,546

Claims priority, application Germany, June 8, 1971, P 21 28 534.7

Int. Cl. B26d *3/12*

U.S. Cl. 83—184 **8 Claims**



An apparatus for slitting a longitudinally fed flattened tube of plastics film comprises a cutting device for forming longitudinal incisions in both walls of the tube near one longitudinal edge thereof, temporarily operative means downstream of the cutting device for separating the tube walls at the longitudinal incisions, and a slitting knife which is disposed downstream of the cutting device in the medial plane of the tube, is adapted to enter the tube through the separation brought about by the separating means, and is thereafter adapted to slit the tube along said longitudinal edge.

3,789,714

WEB FEEDING AND CUTTING ARRANGEMENTS

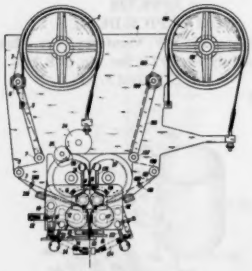
Helmut Demny, Gevelsberg/Westfalen, Germany, assignor to Maschinenfabrik Alfred Schmermund, Gevelsberg, Germany

Continuation-in-part of Ser. No. 838,963, Aug. 12, 1971, abandoned. This application Aug. 12, 1971, Ser. No. 173,707

Claims priority, application Great Britain, July 19, 1968, 34,599/68

Int. Cl. B26d *5/20*; **B65h** *25/10*

U.S. Cl. 83—272 **4 Claims**



This invention relates to an arrangement for feeding a web of material through a cutting device. Independently operable withdrawing and guiding means for drawing two webs of material from respective bobbins are provided. Both webs are brought into the vicinity of the cutting device. One web remains at rest, while the other, in an intermittent motion, travels further into the cutting device and is transversely cut by this device during stop periods of this travel. When the trailing end of the first web is detected, indicating that the supply of web from the first bobbin is exhausted, the other web is traversed through the cutting device whilst the first bobbin is replenished.

3,789,715

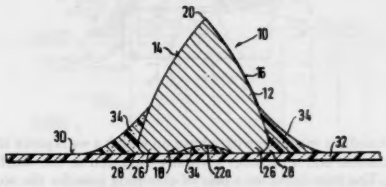
ROTARY CUTTING APPARATUS

Rudolf Schuchardt, and Hans George Schuchardt, both of Pastfach 510 Hemer, Germany

Filed Jan. 4, 1972, Ser. No. 215,309

Int. Cl. B26d *1/12*

U.S. Cl. 83—663 **12 Claims**



For rotary cutting apparatus strip-like cutting blades are provided that can be easily handled in a universal manner. The cutting blades are of a cross-section so that they may be bent about an axis perpendicular to their longitudinal axis. A flat back-surface permits stable connection to a supporting surface. Longitudinal grooves may receive cement securing the blades to the supporting surface. Preferably, the supporting surface confines a support member made of transparent foil material that can be placed above a respective drawing indicating the desired pattern for the cutting blades.

3,789,716

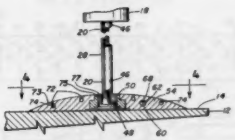
DEVICE FOR CUTTING SHEET MATERIAL

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., East Hartford, Conn.

Division of Ser. No. 59,899, July 31, 1970, Pat. No. 3,735,660. This application Dec. 11, 1972, Ser. No. 314,129

Int. Cl. B26d *1/10*; **A41h** *43/00*

U.S. Cl. 83—747 **9 Claims**



A device for cutting sheet material, such as a layup of fabric sheets spread on a cutting table, includes a cutter head movable over the table and having a vertically reciprocating knife or other similar cutting tool. The cutter head is moved by numeric control relative to the table to cause its tool to follow a desired line of cut, and associated therewith is a guide or receiver which moves both longitudinally and transversely of the table in unison with the tool, between the supporting surface of the table and the bottom layer of the material, and receives the lower or distal end of the cutting tool to provide additional support for the tool and to inhibit tool deflection.

3,789,717

BANDSAW MACHINE

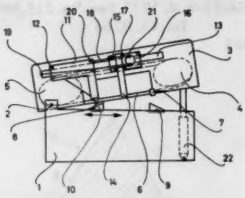
Paul Stolzer, Achen, Germany, assignor to Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Co., KG., Achen, Germany

Filed Nov. 28, 1972, Ser. No. 310,073

Claims priority, application Germany, Dec. 1, 1971, P 21 59 580.2

Int. Cl. B23d *55/04, 55/08*

U.S. Cl. 83—796 **12 Claims**



A bandsaw machine with a base on which a workpiece table is mounted and a member pivotally mounted to the machine base. The base includes a pair of clamping jaws for the workpiece with the jaw closest to the pivotal mounting being adjustable and with the other jaw being fixed. The pivotally mounted member includes at least two reversibly driven pulleys, an endless saw band extending partially around and between the pulleys and a pair of guides for the saw band with the guide closest to the pivotal mounting being adjustable and with the other guide being fixed in the running direction of the saw band. Both guides are mounted to the pivotally mounted member so that in those instances where the plane of rotation of the reversibly driven pulleys is inclined to a feed plane defined by the pivotal movement of the pivotally mounted member, they will direct a portion of the saw band between the pulleys into the feed plane for cutting the workpiece. A control arrangement is provided for automatically and simultaneously adjusting both the adjustable clamping jaw and the adjustable guide.

3,789,718

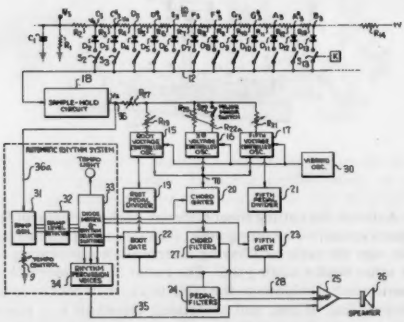
VOLTAGE CONTROLLED CHORD ORGAN

David A. Bunger, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Dec. 30, 1971, Ser. No. 213,939

Int. Cl. G10h *1/00*

U.S. Cl. 84—1.01 **26 Claims**



An electronic chord organ, in which voltage controlled oscillators are each supplied with the same voltage, the voltage being selected by actuation of keys of an organ keyboard, and the currents supplied to the individual oscillators being selected to sound a musical chord. The voltage controlled oscillators each receive voltages from a resistive voltage divider via a voltage sample and hold circuit, key switches applying voltage from selected points along the voltage divider via diodes to a common bus, the bus controlling the frequencies of all the oscillators, and the diodes serving to render only one key switch operable to apply voltage to the bus when plural ones of the key switches are simultaneously closed.

3,789,719

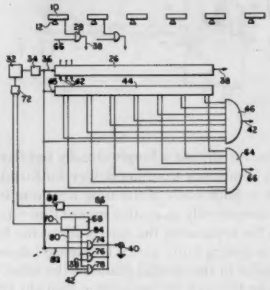
TAPE ACTIVATED PIANO AND ORGAN PLAYER

Joseph Maillet, Hammonton, N.J.

Filed Aug. 28, 1972, Ser. No. 284,352

Int. Cl. G10f *5/00*

U.S. Cl. 84—115 **5 Claims**



A system for recording piano or organ music on a recording tape and replaying the tape to actuate a reproduction of the music on a playback piano or organ, the system including electrical means to sample, store and transmit signals from the individual keys of the first instrument to a recording tape, means to count a predetermined number of these signals and to continuously reset the system to sample, store and transmit a further predetermined number of signals after each predetermined number has been transmitted, and means to receive the transmitted signals from the tape, and reproduce these signals on the second instrument by means of causing each signal to actuate a means to play a corresponding key on the second instrument.

3,789,720

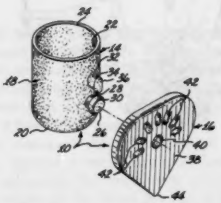
GUITAR PICK DEVICE

Thomas M. McIntyre, 2562 W. Monterey Way, Phoenix, Ariz.

Filed July 11, 1973, Ser. No. 378,214

Int. Cl. G10d *3/16*

U.S. Cl. 84—322 **7 Claims**



A device for plucking a stringed instrument having a deformably resilient thimble for wearing on the finger of a player and to which a guitar pick is demountably attached and lockably movable into several angular positions relative to the thimble as dictated by the personal preference of the player.

3,789,721

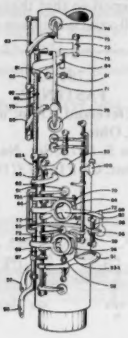
OBOE FINGERING SYSTEM AND MOUTHPIECE

Dick Paladino, 4221 San Bernardino Ave., Las Vegas, Nev.

Continuation-in-part of Ser. No. 234,481, May 15, 1972. This application Apr. 9, 1973, Ser. No. 349,625

Int. Cl. G10d 7/00

U.S. Cl. 84—380 A 5 Claims



The new oboe or English horn fingering system of the invention comprises a series of new keys added to the instrument and rearrangement of a number of existing keys which cooperate to achieve a new and more versatile fingering system.

3,789,722

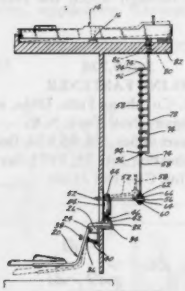
FOOT OPERATED PIANO PLAYING DEVICE

Roger A. Hanes, 327 S. 10th St., Fort Dodge, Iowa

Filed Mar. 22, 1973, Ser. No. 343,939

Int. Cl. G10c 3/12

U.S. Cl. 84—426 7 Claims



A foot operated piano playing device comprising 13 foot pedals which are operatively connected to the bass keys of the piano. Each of the foot pedals are operatively connected to a pair of bass keys so that the depression of the pedal will cause the keys to vibrate two piano strings to sound a given octave. The linkage connecting the foot pedal to the keys is designed so that all of the key actuator rods are positioned in the same vertical plane. The design of the linkage permits the keys to be actuated with equal amounts of "push" pressure.

3,789,723

GROUP TRAINING SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENTS

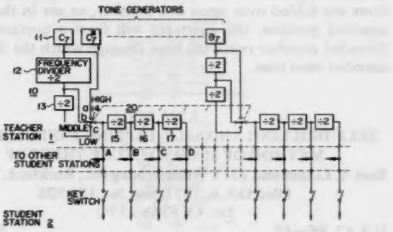
Eisaku Okamoto, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed Aug. 8, 1972, Ser. No. 278,823

Claims priority, application Japan, Aug. 9, 1971, 46/70440; Mar. 21, 1972, 47/32301; Mar. 21, 1972, 47/32302

Int. Cl. G09b 15/00

U.S. Cl. 84—470 11 Claims



A group training system for electronic musical instruments including a teacher station and a plurality of student keyboard instrument stations wherein the teacher station has a plurality of tone generators corresponding to one octave of musical notes. Each tone generator is connected to a first divider chain including a plurality of cascade connected frequency dividers. The outputs of the tone generator and the frequency dividers are selectively supplied through a multithrow switch operable by the teacher to a second divider chain similarly including a plurality of cascade connected frequency dividers. The signals successively frequency-divided by the dividers of the second chain, as well as the input signal thereto, are all fed to each student station to provide a certain range of musical notes. Where the teacher operates the multithrow switch, the frequency of the input signal impressed on the second divider chain varies, resulting in a change in the performance compass of the student stations. The input signals impressed on the second divider chain may be varied for groups of the student stations to enable ensemble performance.

3,789,724

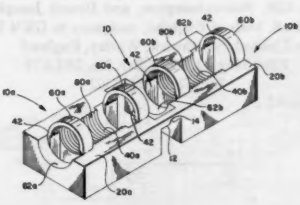
FASTENER

Thomas M. Moran, Cleveland, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed July 12, 1972, Ser. No. 270,901

Int. Cl. F16b 37/00

U.S. Cl. 85—32 V 14 Claims



A molded, internally threaded fastening device adapted for receipt of a threaded member. The fastening device is molded in a generally flat position with two preferably joined complementary sections adapted to be manually folded over upon one another, in face-to-face relationship, to form the fastener. Each complementary section defines a generally concave cavity extending along the complementary face which will cooperate with the concave cavity in the complementary face

of the other complementary section to define a generally axially extending threaded member receiving bore when the two complementary sections are folded over upon one another. Each concave cavity includes molded internal thread portions on the concave surface thereof which are adapted to cooperate and register with the molded thread portions in the other cavity to form a continuous internal thread along at least a part of the threaded member receiving bore. Each complementary section also includes at least one convexly extending loop which in connection with the concave cavity defines a substantially circular aperture. When the complementary sections are folded over upon one another, or are in the preassembled position, the apertures will form a portion of the threaded member receiving bore through which the threaded member must pass.

3,789,725

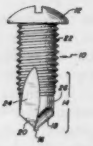
SELF-DRILLING AND SELF-TAPPING FASTENER AND METHOD OF MANUFACTURE THEREOF

Bert A. Lindstrom, 1311 Williamsburg Rd., Rockford, Ill.

Filed Oct. 6, 1971, Ser. No. 186,928

Int. Cl. F16b *25/00*

U.S. Cl. 85—47 **5 Claims**



This improved non-walking, non-skittering self-drilling and self-tapping screw fastener is manufactured by a simplified, versatile method comprising pointing and fluting steps involving axial movement of end mill cutters. The resulting threaded fastener features a pair of oppositely-disposed, substantially longitudinally extending milled flutes at the entering end, each of the flutes having a uniformly-concavely-curved flute side including the cutting edge, a plane tangent to the concavely curved surface at the cutting edge extremity being inclined at an angle to and traversing the axis of the screw at an intermediate point of the shank. In a preferred embodiment having enhanced chip-breaking characteristics, the curvature and disposition of the flutes are such that they redirect the normal chip flow and thereby fragment the chips by flexure.

3,789,726

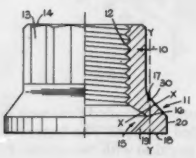
LOAD-INDICATING MEANS FOR A NUT AND BOLT ASSEMBLY

Peter John Gill, Wolverhampton, and Dennis Joseph O'Donnell, Walsall, both of England, assignors to GKN Screws & Fasteners Limited, Smethwick, Warley, England

Filed May 22, 1972, Ser. No. 255,679

Int. Cl. F16b *31/02*

U.S. Cl. 85—62 **5 Claims**



A load-indicating nut in which the nut body has at one end a radially extending flange and wherein the cross section of the flange taken in a radial plane is such that there is provided an internal surface to the annular flange which takes the form of an annular groove of generally V-section with the apex thereof directed radially outwardly and the one leg of this V-section which is joined to the body being constructed and arranged so that when the axial tensile load in the bolt shank reaches or exceeds a predetermined minimum value, plastic deformation of the metal of the flange takes place in shear in this one leg and the body moves in a direction towards the abutment against which it is being tightened so that there occurs a measurable reduction in the overall axial dimension of the nut.

3,789,727

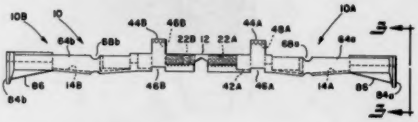
FASTENER

Thomas M. Moran, Cleveland, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed June 5, 1972, Ser. No. 259,422

Int. Cl. F16b *13/10*

U.S. Cl. 85—71 **22 Claims**



A molded, one-piece, self-anchoring fastening device adapted for receipt of a threaded member and being self-anchored in an apertured panel or the like. The fastening device is molded in a generally flat position with two joined, substantially cross-sectionally semicircular or C-shaped complementary sections adapted to be manually folded over upon one another, concave-side-to-concave-side in a preassembled position, to form an axially extending, substantially hollow, cross-sectionally circular device. Each semicircular section carries a loop projecting convexly outwardly from opposed ends of C-shaped section which, in connection with the concave surface, form a substantially circular aperture and which are adapted to coact with the concave surface of the other section upon folding to releasably maintain the sections in a folded position. The apertures defined by the loops partially define the axial passage through the preassembled axially extending hollow body through which the received threaded member must pass.

3,789,728

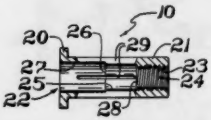
BLIND FASTENER

James R. Shackelford, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Continuation-in-part of Ser. No. 95,824, Dec. 7, 1970, abandoned. This application July 25, 1972, Ser. No. 274,853

Int. Cl. F16b *13/04*

U.S. Cl. 85—71 **5 Claims**



A one-piece blind fastener, of the kind which serves as a nut plate, has a head to bear against the exposed face of a structural member having a hole in it, and a cylindrical hollow body to pass through the hole and expand in a flower petal shape against the blind face of the structural member when shortened by pulling up a threaded draw rod. The head and the internally threaded far end are circumferentially continuous,

and are integral with the body. The intermediate portion of the body which protrudes through the hole is longitudinally divided into strips and has an internal shallow step or offset about midway of its length.

3,789,729

APPARATUS AND METHOD FOR THE STORAGE AND LAUNCHING OF A MISSILE

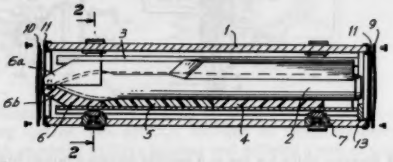
Roland Rolland Aupy, Ruelle-sur-Trouvre, France, assignor to Etat Francais represente par le Ministre d'Etat charge de la Defense Nationale Delegation, Paris, France

Filed Feb. 23, 1972, Ser. No. 228,577

Claims priority, application France, Feb. 24, 1971, 71.06207

Int. Cl. F41f 3/04

U.S. Cl. 89—1.8 8 Claims



A container of square or rectangular sections receives two slide rails which are fixed therein, the missile being held in the rails by means of front, central and rear shoes composed of polyurethane foam blocks. The missile, rails, rear shoes and central shoes are assembled outside the container and then inserted inside the container whereupon the rails are secured to the container. Covers at the rear and front of the container are made of plastic, the front cover having a central weak zone which is destroyed under the thrust of the front shoes when the missile is launched.

3,789,730

AUTOMATIC WEAPON WITH SELF LOCKING BOLT BREECH BLOCK

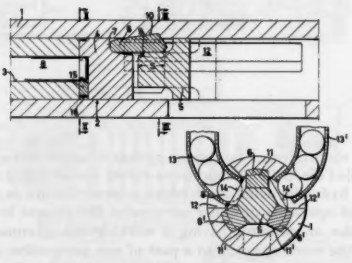
Alfred Helmes, Willich, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed Aug. 24, 1971, Ser. No. 174,369

Claims priority, application Germany, Sept. 11, 1970, 2044964

Int. Cl. F41d 3/00, 9/02

U.S. Cl. 89—183 2 Claims



An automatic weapon including a self locking bolt which comprises a weapon casing defining a loading chamber. A breech block moves forwards and back and is adapted to insert a cartridge into the loading chamber during the forward movement of the breech block. At least three laterally pivotable locking bolts are provided symmetrically to the longitudinal central axis of the breech block, for complete locking of the breech block against the weapon casing.

3,789,731

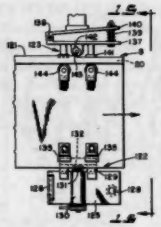
EDGE TRIMMING APPARATUS

George W. Loy, Scio, Ohio, assignor to Scio Cabinet Company, Inc., Scio, Ohio

Division of Ser. No. 114,290, Feb. 10, 1971, Pat. No. 3,690,955, which is a division of Ser. No. 885,014, Dec. 15, 1969, Pat. No. 3,580,787. This application July 7, 1972, Ser. No. 269,592

Int. Cl. B23b 3/12

U.S. Cl. 90—11 R 4 Claims



A plastic laminating apparatus for laminating plastic sheet material to a countertop core having a backsplash attached at right angles thereto during a single pass through the apparatus. The apparatus consists of a plurality of longitudinally spaced work stations through which the work is successively moved for progressively shaping and adhering the plastic laminate to the work, such work being guided through the apparatus by receipt of a downwardly projecting portion from the work in a guide track extending the entire length of the apparatus. A back die bends the laminate to conform to the general shape of the backsplash and countertop after heating, and fingers and pressure rolls are used to progressively bend and press the projecting edges of the laminate into firm contact with the edges of the countertop and backsplash. Floating cutters are also used to trim the excess laminate material extending beyond the countertop and backsplash edges, and such excess material may be picked up by a suction blower or removed by a rotary brush prior to passage through final pressure rolls.

3,789,732

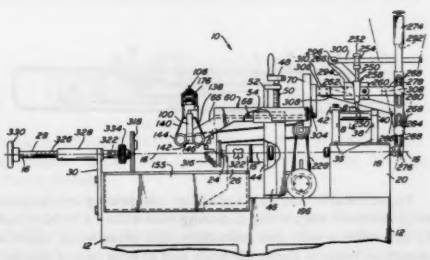
MACHINE FOR ENGRAVING CURVED SURFACES

Jack W. Levine, Levittown, N.Y., assignor to New Hermes Company, New York, N.Y.

Filed May 16, 1972, Ser. No. 253,724

Int. Cl. B23b 1/18

U.S. Cl. 90—13.6 18 Claims



A machine for engraving surfaces which are cylindrical, tapered or curved. The machine includes pattern tracing means and an engraving tool connected thereto by a mechanism which causes the movement of the tracing means in the pattern to be reproduced by the engraving tool. Means are provided for always maintaining the engraving tool perpendicular to the surface which is being engraved.

3,789,733

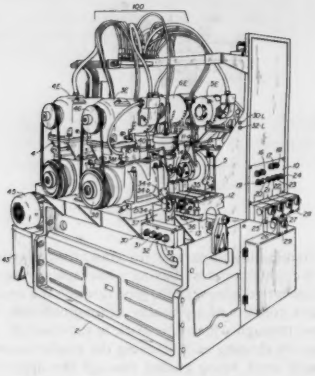
KEYWAY CUTTING AND MILLING MACHINE

Lee E. Thompson, and William W. Ramsey, both of Tulsa, Okla., assignors to Ramsey Winch Co., Tulsa, Okla.

Continuation-in-part of Ser. No. 139,503, May 5, 1971, abandoned. This application Nov. 7, 1972, Ser. No. 304,334

Int. Cl. B23c 3/30

U.S. Cl. 90—14 5 Claims



A new and improved automatic Keyway Cutting and Milling Machine for cutting one or more keyways in stock material simultaneously, the said machine being electrically programmed to clamp the movement of stock material being processed and to automatically control the operation of the hydraulic system which operates the milling head assemblies, the said milling head assemblies and the clamping of material being all coordinated to work as a unit.

3,789,734

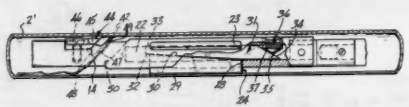
ADJUSTABLE SCARFING TOOL

Denis R. Boston, Livingston, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 21, 1972, Ser. No. 246,307

Int. Cl. B23d 1/24

U.S. Cl. 90—24 B 7 Claims



An adjustable scarfing apparatus comprising an elongated body member supporting a cutting tool within a welded tube. In accordance with one embodiment, a plurality of slides are dispersed radially about the body and at least one of the slides is made continuously adjustable inwardly or outwardly from the body. In accordance with another embodiment, a cutting tool having a circular cutting edge which may be indexed is employed with the plane of the cutting edge. The plane of the cutting edge is inclined at an angle of from about 30° to about 60° to the longitudinal axis of the tube. Alternatively, the apparatus may include both of these embodiments.

3,789,735

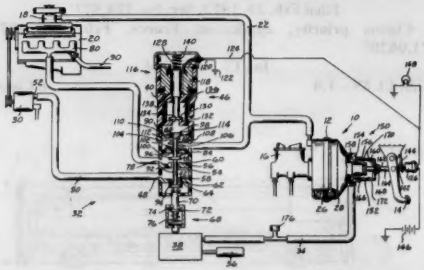
DIVERTER VALVE MEANS FOR PRESSURE DIFFERENTIALLY OPERATED SERVOMOTOR

George M. Tam; Delbert J. Gardner; Frederick G. Grabb; James B. Putt; Carl D. Owens, and William C. Sisco, all of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Feb. 15, 1973, Ser. No. 332,857

Int. Cl. F01b 31/12; F15b 21/00

U.S. Cl. 91—1 10 Claims



A diverter valve for use in a vehicle having a power braking system operated by a pressure differential servomotor. The diverter valve directs air under pressure from an emission control pump to the servomotor in response to a signal generated upon actuation of the brake pedal to supply a first fluid under pressure which in conjunction with a second fluid creates the desired pressure differential in the servomotor.

3,789,736

MULTIPLE HYDRAULIC ACTUATOR

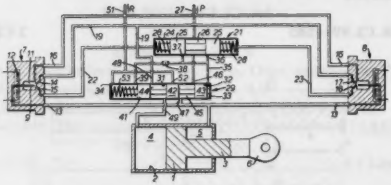
John Hall Williams, Wolverhampton, England, assignor to Dowty Boulton Paul Limited, Wolverhampton, England

Filed Dec. 13, 1971, Ser. No. 207,302

Claims priority, application Great Britain, Dec. 11, 1970, 58885/70

Int. Cl. F15b 13/02, 15/17

U.S. Cl. 91—3 10 Claims



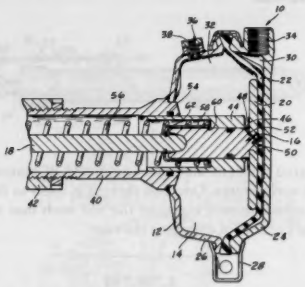
An electro-hydraulic control system in which two similarly signalled electro-hydraulic servo-valves are provided to control a hydraulic actuator. In order to detect failure or inaccuracy of operation of either servo-valve the present invention provides an actuator having a working space, connections from the working space to a port of one servo-valve and the corresponding port of the other servo-valve whereby the actuator is under the simultaneous control of both servo-valves, biassing means urging the actuator in a direction opposite to the hydraulic force generated in the working space and an error means connected between the other two ports of the servo-valves to generate an error signal when there is a substantial pressure difference between the said ports. The error signal may be used to take any safety action appropriate to the use of the actuator.

3,789,737

SELF-PURGING BRAKE ACTUATOR

Richard T. Burnett, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Mar. 27, 1972, Ser. No. 238,547
Int. Cl. F15b *15/17, 11/08, 13/042*
U.S. Cl. 91—416 **3 Claims**



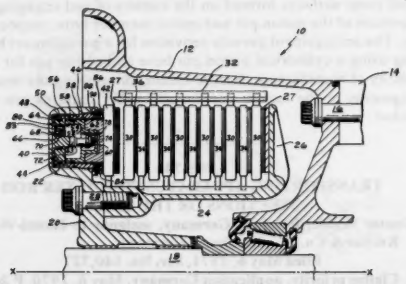
A brake actuator is disclosed for fluid pressure actuating braking system. The actuator includes an actuating piston slidably mounted within a housing and defining a pair of pressure chambers between opposite ends of the piston and corresponding ends of the housing. High pressure fluid is communicated into one of the chambers where it acts upon the end of the piston to drive the latter in a brake actuating direction. A check valve permits air to exhaust from the other chamber, but prevents atmospheric air from being drawn into the latter when the piston is returned upon release of the brake. A sleeve is slidable relative to the piston and moves relative to the latter when the piston is actuated to prevent communication between the chambers during a brake actuation, but opens the passage upon return movement of the piston upon release of the brakes to permit fluid in the one chamber to communicate into the other chamber, thereby preventing contamination of the latter by atmospheric air.

3,789,738

EXTENSIBLE PISTON

Richard F. Horner, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Mar. 24, 1972, Ser. No. 237,777
Int. Cl. F15b *11/18;* **B60t** *11/00*
U.S. Cl. 91—168 **5 Claims**



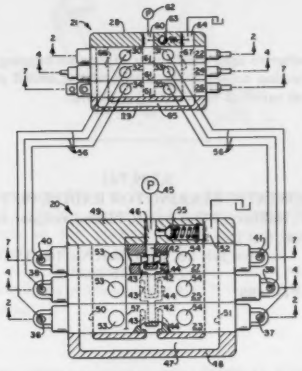
A fluid pressure actuated piston having an outer piston member and an inner piston member slidable therein which pistons have equivalent areas exposed to said fluid pressure and are sequentially pressurized thereby providing extended piston travel. The outer piston is operatively connected to a normally closed fluid vent which is opened to vent the pressurized fluid to the inner piston substantially simultaneously with engagement of the outer piston with a fixed stop whereupon the inner piston continues to move.

3,789,739

REMOTE HYDRAULIC CONTROL

Robert D. Krehbiel, Hutchinson, and Homer R. Graber, Pretty Prairie, both of Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed Aug. 2, 1971, Ser. No. 168,002
Int. Cl. F15b *13/16*
U.S. Cl. 91—358 A **13 Claims**



A closed center remote control system selectively modulating pressure at either end of a reciprocal spool control valve so as to incrementally position the valve spool with such precision to attain spool metering and speed control. The various embodiments include diverse special operating modes such as float and automatic return-to-neutral. The remote system is equally useful in conventional closed center and open center spool valves essentially identical to manually operated valves.

3,789,740

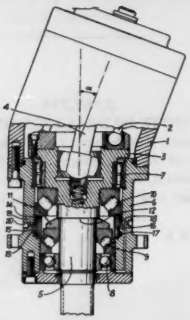
ROTARY DEVICE WITH ADJUSTABLE AXIAL BEARING

Jean-Jacques Boyer, 95 Quai Winston Churchill, Val De Marne, France

Continuation of Ser. No. 126,075, March 19, 1971, abandoned. This application Mar. 28, 1973, Ser. No. 345,908
Claims priority, application France, Mar. 20, 1970, 7010098
Int. Cl. F04b *13/04*
U.S. Cl. 91—486 **1 Claim**

A swash plate pump or motor has roller bearing means to receive the axial thrust of the swash plate, in the form of a plurality of axially spaced roller bearing assemblies one of which is fixed and the other or others of which bear axially against a stepped ring piston that defines an annular piston chamber

with a stepped portion of the inner side wall of the pump casing. The pressure of the working fluid is supplied to this annu-



lar chamber to urge the axially adjustable bearing or bearings in a direction to resist the thrust of the swash plate, with a force that varies as the working pressure.

3,789,741

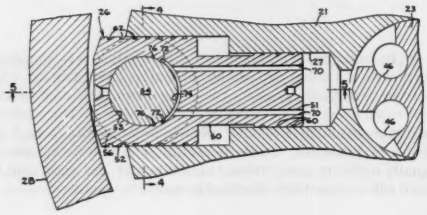
HYDROSTATIC BEARING FOR RADIAL PISTON PUMP

Daniel F. Hallberg, Minneapolis, Minn., assignor to FMC Corporation, San Jose, Calif.

Filed July 26, 1971, Ser. No. 166,157

Int. Cl. F01b *1/00*

U.S. Cl. 91—488 **3 Claims**



A radial piston pump is provided with pistons which utilize a hydrostatic bearing between the body of the piston and the crosshead rollers, i.e., the thrust accommodating elements that contact the rotor reaction ring in the pump assembly. In order to provide for this bearing, holes are drilled longitudinally through the piston into the bore in the head of the piston where a crosshead pin is mounted. The crosshead pin extends transversely through the body of the piston, and the crosshead rollers are keyed to the ends of the pin which project laterally from the head of the piston. Interconnected grooves are provided about the bore in the piston body which grooves are in communication with the holes through the piston to receive the lubricating medium being pumped, and the area circumscribed by the grooves is such that the pressure load on the piston is generally balanced, i.e., the hydrostatic loading on the rearward end of the piston is balanced by the hydrostatic loading on the crosshead pin.

3,789,742

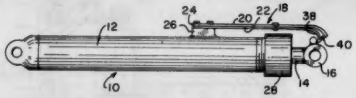
HYDRAULIC CYLINDER LATCH

Gordon L. Hershman, La Grange, and Wilbur E. Schwerdtfeger, Western Springs, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 16, 1972, Ser. No. 307,307

Int. Cl. F15b *15/26*

U.S. Cl. 92—26 **6 Claims**



Elongated resilient member comprised of materials having different spring rates. One end thereof is fixed to the cylinder, and the other extends out over the rod such that an arcuated portion is capable of engaging the rod.

3,789,743

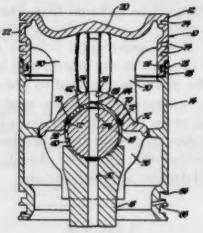
ECCENTRIC PIN BEARING

Tanas M. Sihon, Ypsilanti, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1972, Ser. No. 229,695

Int. Cl. F16j *1/16;* **F16c** *11/00*

U.S. Cl. 92—187 **5 Claims**



In a preferred embodiment, a trunnion-type piston pin is eccentrically received in the cylindrical bore of a piston member having bifurcated arms encircling and engaging the lower side of the piston pin. An arcuate bearing segment is received in a saddle portion of the piston member bore between it and the piston pin to transfer combustion loads therebetween. The bearing segment is of varying thickness having arcuate inner and outer surfaces formed on the centers of and engaging the surfaces of the piston pin and piston member bore, respectively. The arrangement permits provision for a partial insert bearing using a cylindrical piston pin bore and piston pin for simplicity of manufacture. Simple means for securing the bearing segments in the saddle portion and other features are provided.

3,789,744

TRANSPORTING APPARATUS FOR FILTER ROD SECTIONS OR THE LIKE

Gunter Wahle, Reinbek, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed May 6, 1971, Ser. No. 140,727

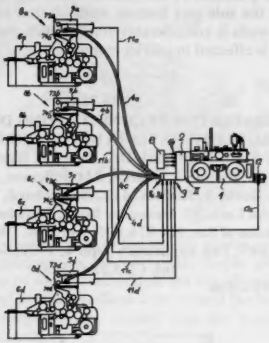
Claims priority, application Germany, May 6, 1970, P 20 22 175.4

Int. Cl. A24c *5/48;* **B65g** *51/02, 65/30*

U.S. Cl. 93—1 C **15 Claims**

The outlet of a filter rod making machine is directly or indirectly connectable with the magazines of several filter cigarette making machines by means of pneumatic conduits.

The inlets of the conduits receive filter rod sections by way of discrete transfer units which form part of a distributor system serving to permit entry of filter rod sections into a selected transfer unit in response to signals from detectors which are mounted in the magazines of the filter cigarette making machines. When the requirements of the filter cigarette making machines do not match the output of the filter rod making machine, the latter machine is caused to operate at a reduced speed or delivers filter rod sections into an auxiliary magazine which can supply filter rod sections to the distributor system if the filter rod making machine is idle or if the requirements of the filter cigarette making machines exceed the output of the filter rod making machine.



3,789,745

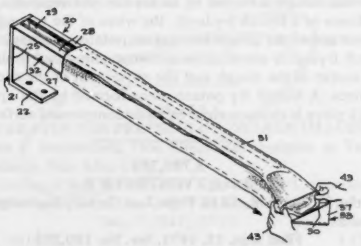
MEANS FOR INSERTING LINERS IN BAGS

Harold Leader, P.O. Box 325, Helena, Ala.

Filed May 22, 1972, Ser. No. 255,429

Int. Cl. B31b *1/00, 11/00*

U.S. Cl. 93—8 R **5 Claims**



A method and apparatus for inserting liners in outer bags, whereby the bags can subsequently be filled with any desired material.

3,789,746

PACKAGING MACHINE

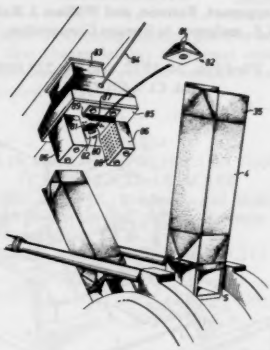
Kjell Halvard Martensson; Bjorn H:son Linde, both of Malmo; Jan Frederik Palsson, and Sven Torsten Jerre, both of Lund, all of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Division of Ser. No. 227,812, Feb. 22, 1972. This application July 17, 1972, Ser. No. 272,214

Claims priority, application Sweden, Mar. 25, 1971, 3864/71

Int. Cl. B65b *3/02, 51/20*

U.S. Cl. 93—39.2 **5 Claims**



A packaging machine in which packages are erected on mandrels of a rotating wheel and the crease lines of the bottom elements of the packages are successively creased, heated, folded and sealed; the heating being carried out by a heated gas which is directed by deflector means against the thermoplastic lining of the package and into the corners of the erected package.

3,789,747

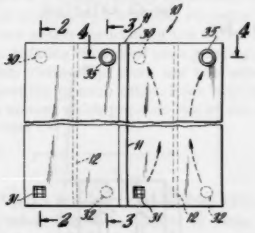
VENTILATED ACOUSTIC STRUCTURAL PANEL

Seymour Wasserman, Plainview; Albert Cirulli, and Edward A. Farrar, both of Bronx, all of N.Y., assignors to Industrial Acoustics Company, Inc., Bronx, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,291

Int. Cl. F24f *13/00*

U.S. Cl. 98—33 **6 Claims**



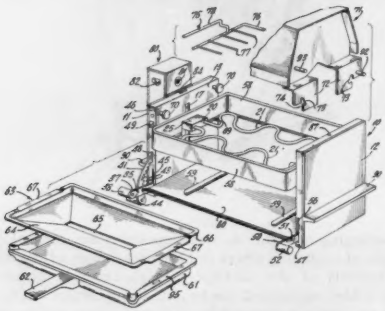
A prefabricated structural wall panel for the modular construction of soundproof enclosures containing layered compartments of shallow depth with the central compartment divided longitudinally into a pair of intake and exhaust ventilation ducts located edge to edge, and these ducts are separated by perforate sheet metal walls from the adjoining interior and exterior compartments of the panel which contain sound absorbing thermal insulation. An air inlet is installed near the lower end of each duct and an air outlet near its upper end;

and a fan is enclosed within the air intake system. Fresh air enters near the lower end of the exterior of the panel and is forced upwardly through the intake duct by the fan to the upper part of the panel from which it is discharged into the enclosure, while the air being exhausted from the enclosure enters a conduit near the bottom of the interior face of the panel and passes up through the exhaust duct for discharge through a conduit communicating with the upper exterior face of the panel.

3,789,748
MULTI-PURPOSE ROTISSERIE-BROILER COMBINATION

Seymour Rappoport, Rumson, and William J. Rakocy, Clifton, both of N.J., assignors to Ronson Corporation, Woodbridge, N.J.

Filed Feb. 24, 1972, Ser. No. 228,809
Int. Cl. A47j *37/06*
U.S. Cl. 99—340 **6 Claims**

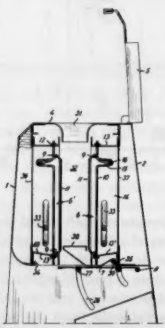


A combined rotisserie-broiler having a movable heating element which can be placed adjacent or remote from food to be cooked. The rotisserie-broiler is a multi-purpose unit having a removable hood, reflector and fry pan which can be arranged in a plurality of positions to permit the user to selectively fry, grill, broil, sear and bake foods.

3,789,749
TOASTER

Julius Barclay Estrup Paaskesen, 17-19, Naverland, Glostrup, Denmark

Filed Aug. 24, 1972, Ser. No. 283,377
Int. Cl. A47j *37/08*
U.S. Cl. 99—391 **6 Claims**

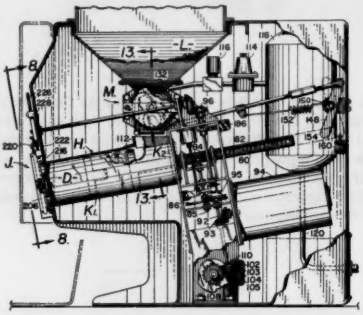


A toaster in which a vertical toasting compartment is closed during a toasting operation by means of a movable bottom wall. After termination of the toasting operation the bottom wall is retracted so as to permit the toasted bread to be discharged from the compartment. The retraction of the bottom wall may be automatically controlled by a timing device and it may be effected by swinging the bottom wall downwardly on a horizontal pivot axis. The opposed side walls of the toasting compartment are movable in vertical direction and are coupled to the bottom wall in such a way that the side walls are lifted slightly when the bottom wall is retracted to its discharge position. A lost-motion coupling may be provided between the side and bottom walls so that the movement of the side walls is considerably smaller than that of the bottom wall and is effected in a jerky manner.

3,789,750
APPARATUS FOR RECONSTITUTING DRY POTATO AGGLOMERATES INTO POTATO DOUGH

Roderick Beck, 1065 York Dr.; James F. Harman, 750 Wootton Way; Mounir A. Shatila, 241 Jefferson, all of Blackfoot, Idaho; David A. Richins, 4122 S. Orchard, Bountiful, Utah, and John Lack, 81 Alexander Blvd., Blackfoot, Idaho

Division of Ser. No. 816,675, April 16, 1969, Pat. No. 3,605,647. This application Sept. 4, 1970, Ser. No. 69,884
Int. Cl. A23n *15/00*
U.S. Cl. 99—536 **7 Claims**



A machine for forming from potato dough elongate bodies that resemble potato pieces suitable for french frying. The machine is arranged to move the dough through spaces between a set of parallel wires, which wires are spaced from one another by amount corresponding to the width of the piece. The length of the spaces determines the length of the potato piece. A second set of parallel wires is supported in registry with the first mentioned set during dough movement; after the dough is moved by an amount corresponding to the thickness of a french fry body, the wires of the second set are moved across the dough to separate potato pieces suitable for french frying. A machine for automatically synchronizing the movement of the dough and the movement of the second set of wires. A french fry potato piece formed by the apparatus which piece is characterized by an uncompressed surface.

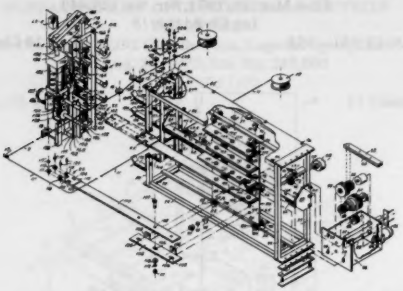
3,789,751
BALE TYING DEVICE

Charles E. Burford, 1414 Frito Lay Tower, Exchange Park, Dallas, Tex.

Filed Sept. 15, 1971, Ser. No. 180,592
Int. Cl. B65b *13/04, 13/28*
U.S. Cl. 100—19 R **18 Claims**

A bale tying device comprising a twister assembly positioned adjacent one side of the compaction chamber of bale forming apparatus and a needle carriage assembly positioned adjacent the opposite side of the compaction chamber such that material is moved between the twister assembly and the

needle carriage assembly as a high density bale is formed. The needle carriage assembly moves intermediate portions of a plurality of strands of wire across the rear end of the compaction chamber to join each of the strands with an intermediate portion of another strand adjacent twister hooks of the twister



assembly. The joined portions of the strands of wire are locked into V-shaped grooves on spaced twister hooks and intermediate portions of the joined strands are cut allowing twisting of the severed portions to form a tie around the bale while simultaneously preparing the unused wire for tying a subsequently formed bale.

3,789,752

APPARATUS FOR COMPRESSING REFUSE

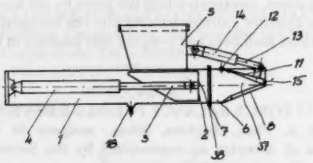
Herbert A. Wirz, CH-8707, Uetikon am See, Switzerland

Filed Sept. 23, 1971, Ser. No. 183,055

Claims priority, application Switzeriand, Dec. 29, 1970, 14370/70

Int. Cl. B30b *1/08, 15/16*

U.S. Cl. 100—98 R **7 Claims**



Apparatus for compressing refuse having a hydraulic ram which receives refuse from a hopper and presses it into a tapered nozzle. The nozzle has a hydraulically biassed flap which is deflected by the refuse to vary the nozzle discharge opening.

In a modification, the nozzle is formed by an S-shaped tube and has a hinged wall portion biassed into the tube.

3,789,753

APPARATUS FOR PRINTING OF CHARGE IMAGES

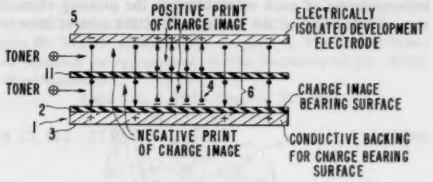
Sherman L. Rutherford, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 135,294, April 19, 1971, abandoned. This application May 29, 1973, Ser. No. 364,455

Int. Cl. B41j *27/16*

U.S. Cl. 101—1 **1 Claim**

An electrically isolated development electrode is disposed immediately adjacent a charge image bearing surface of a charge image bearing structure having a conductive backing. The charge image induces a second charge image in the development electrode and produces an image electric field in the development gap between the first and second charge images. The second charge image further induces a background charge distribution in the backing member of opposite sign to that of the first charge image. An insulative web is disposed in the development gap to receive electroscopic



pigment particles for printing either a positive or a negative print of the first charge image. Additional copies may be printed on successively introduced insulative webs without dissipating the first charge image.

3,789,754

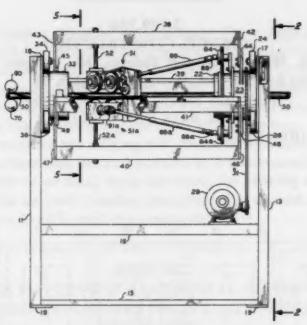
PRINTING IN A HELICAL PATTERN ON ELONGATED CYLINDRICAL ARTICLES

Don L. Shofner; Leroy E. Robinson, and Robert J. Martinovich, all of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Sept. 22, 1972, Ser. No. 291,173

Int. Cl. B41f *17/10*

U.S. Cl. 101—37 **9 Claims**



A machine for printing indicia on cylindrical articles, for example plastic pipe, in a helical pattern is provided with at least one printing unit mounted on a frame rotatable about the pipe, motor driven means for rotating the frame, and motor driven means for rotating the roll of each printing unit which contacts the pipe. Preferably, there are two printing units mounted in opposition to each other. Each printing unit includes an inking system which prevents loss of ink during the rotation of the frame.

3,789,755

PRINTING DEVICES FOR CALCULATING APPARATUS

Henry Gross, London, England, assignor to Gross Cash Registers Limited, London, England

Filed May 2, 1972, Ser. No. 249,519

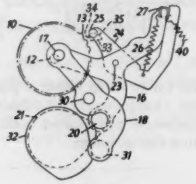
Claims priority, application Great Britain, May 13, 1971, 14725/71; Dec. 22, 1971, 59527/71

Int. Cl. B41j *25/32*

U.S. Cl. 101—95 **3 Claims**

A printing device comprising a row of printing elements each carrying a plurality of printing characters, a plurality of pressure members for pressing a print medium against the printing elements, and so arranged that each pressure member presses said medium against at least one and not more than

three of said printing elements, carrier members carrying said pressure members, each carrier member being associated with at least one and not more than three printing elements, resilient means arranged so as to urge said pressure members independently of each other towards the printing elements, stop means limiting the movement of the carrier members



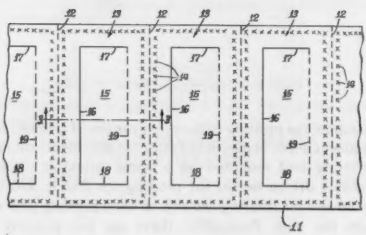
towards the printing elements, and actuating means for moving the carrier member to bring the pressure members to the printing surfaces of the characters until the carrier members move off said stop means and the pressure members are then urged against the printing characters by said resilient means, then moving the pressure members over the characters and finally disengaging the pressure members from the characters.

3,789,756

STENCIL CONSTRUCTION

Joseph A. Weber, Prospect Heights, Ill., assignor to Weber Marking Systems, Inc., Arlington Heights, Ill.

Filed July 20, 1972, Ser. No. 273,613
Int. Cl. B41n *1/24*; **B41l** *13/02*
U.S. Cl. 101—128.2 **1 Claim**



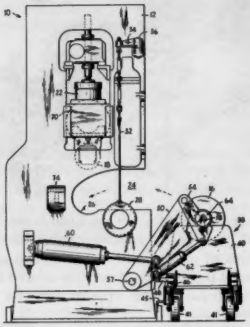
A stencil construction in which a generally rectangularly shaped stencil is adhesively secured along its peripheral edges to a backing sheet. The stencil and backing sheet have a generally rectangularly shaped central copy portion in which no adhesive is used therebetween. The central portion of the backing sheet is cut through on selected portions of its periphery and at least one side edge of the central portion of the backing sheet is perforated therealong so that it may optionally be used as a hinge for the remainder of the central portion or the central portion of the backing sheet may be torn off after the stencil has been cut with desired legends. During cutting of the stencil the backing sheet is in abutting position behind the central copy portion of the stencil. It is only during use of the stencil as a reproducing tool that the central portion of the backing sheet is either swung out of the way about its perforated hinge or torn off.

3,789,757

PRINTING PRESS HAVING AUTOMATIC PRINTING CYLINDER LOADING AND UNLOADING APPARATUS

John C. Motter; John C. Motter, Jr., and Dean R. Swagert, all of York, Pa., assignors to John C. Motter Printing Press Co., York, Pa.

Filed Mar. 26, 1971, Ser. No. 128,442
Int. Cl. B41f *9/18*
U.S. Cl. 101—153 **10 Claims**



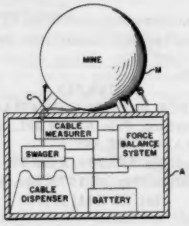
Apparatus for automatically loading and unloading printing cylinders from a rotogravure printing press. The printing press, which is of itself conventional, includes two upright frame members having horizontal openings for lateral insertion of the journals of a printing cylinder. According to the invention, a transport arm is pivoted at one end on each of the frame members and provided at the other with a device for supporting and lifting a journal of the printing cylinder. Means are also provided for separately moving the two transport arms and lifting devices so that the printing cylinder can be lifted by the lifting devices from a dolly or hoist adjacent the printing press, transported into the press by the transport arms with the cylinder journals passing into the horizontal openings in the frame members and lowered into position in the press.

3,789,758

FORCE BALANCE PRESSURE DEVICE

William A. Plice, Hopkins, Minn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1957, Ser. No. 639,837
Int. Cl. B63f *3/02*
U.S. Cl. 102—13 **8 Claims**



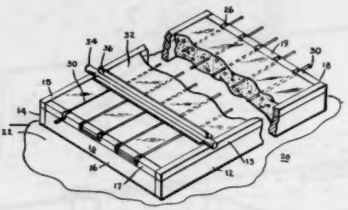
1. In a moored mine and mine anchor having a mooring cable, a force balancing system, said system comprises a pivoted bar, means for applying to one end of said bar a force proportional to the depth of the water in which the anchor rests when on the bottom, means responsive only to the pay out of the mooring cable for applying a force to said bar for counter-

balancing the force applied to the one end of said bar, means actuated by said bar when the counterbalancing force exceeds the applied force to cause the pay out of the cable to stop.

3,789,759
SURFACE RELIEF OF CONCRETE AND METHOD THEREFOR

Robert L. Jones, 30292 Grande Vista, Laguna Niguel, Calif.

Filed Aug. 30, 1972, Ser. No. 285,001
Int. Cl. F42d *1/00*
U.S. Cl. 102—23 **11 Claims**

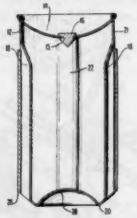


Surface relief of concrete shapes is described wherein an explosive composition is embedded a shallow depth in the concrete shape and is thereafter detonated after the concrete has acquired a permanent set. The detonation removes the over burden of concrete and relieves the surface of the concrete in an aesthetically pleasing manner. The preferred explosive composition is a detonating cord which can be embedded in the concrete in a regular and orderly pattern and at a uniform depth, e.g., about 1/2 to 1 inch beneath the surface of the concrete shape when the concrete is poured into its containing form.

3,789,760
ENCLOSURE FOR EXPLOSIVE MATERIAL

George L. Griffith, Coopersburg, Pa., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Apr. 13, 1972, Ser. No. 243,651
Int. Cl. F42b *3/08*
U.S. Cl. 102—24 HC **11 Claims**

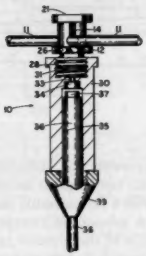


An enclosure for explosive material providing a safe, easily handled explosive booster or primer which can utilize liquid, slurry or solid explosive and which includes recesses to receive detonators. The explosive material is completely enclosed in a container, which illustratively might be an aluminum can including a sealed cover. A sleeve encircles the container. The sleeve and the container cooperate to form recesses for receiving detonators. One type of recess is open on only one end to retain a detonator such as a blasting cap. Another type of recess is open on two opposite ends to permit threading of a detonating cord on which the primer is suspended. The recesses might be formed by indentations in the container sidewall or by furrows in the sleeve. The sleeve can include explosive material to add to the explosive force of the detonator, thereby assuring actuation of the primer.

3,789,761
PROPAGATION TRANSFER ARRANGEMENT

Bruce W. Travor, Holland, Pa., assigaor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1973, Ser. No. 328,989
Int. Cl. C06c *5/06*
U.S. Cl. 102—27 R **3 Claims**

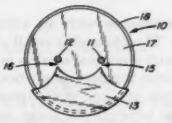


A propagation transfer arrangement for a high-low temperature flexible mild detonating fuze system having an impulse joint selectively connected to a desired portion of a fuze line. The impulse joint includes a base member and an anvil, both grooved or recessed to receive the fuze line desired portion, and a cap for securing the anvil within the base member. The base member has a firing pin, responsive to radial expansion of the fuze line desired portion in a transverse direction and opposite to or away from the anvil, for striking a detonator to ignite an end transfer assembly of a second high-low temperature flexible mild detonating fuze line.

3,789,762
DEVICE TO PREVENT ACCIDENTAL IGNITION OF ELECTRO-EXPLOSIVES FROM ELECTROSTATIC DISCHARGE

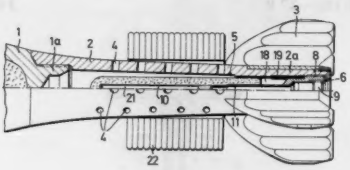
John T. Petrick, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, D.C.

Filed Mar. 30, 1972, Ser. No. 239,527
Int. Cl. F42g *3/18*
U.S. Cl. 102—28 R **2 Claims**



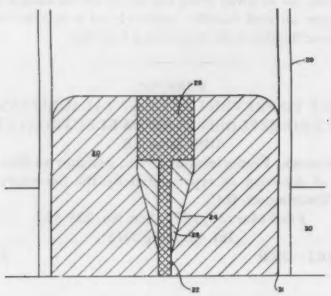
Conductive structure connected to a electroexplosive device casing and extending into close proximity to igniter electrical lead wires at a place where discharge of stray electrostatic charges across a spark gap from one or both of said lead wires to the conductive means will not cause ignition of the electroexplosive devices.

3,789,763
FIN-STABILIZED PROJECTILE FOR LAUNCHERS, MORTARS AND THE LIKE
Frederic Arno Donner, Rahapajankatu 1, Helsinki 16, Finland
Filed Oct. 21, 1971, Ser. No. 191,273
Claims priority, application Germany, Oct. 21, 1970, P 20 51 574.6
Int. Cl. F42b 9/00
U.S. Cl. 102—49.2 9 Claims



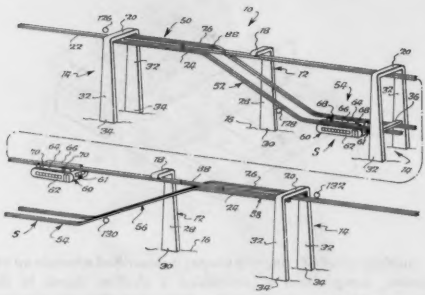
A fin-stabilized projectile for launchers, mortars and the like includes an annular tail member secured to the rear end of the projectile body with a fin assembly secured to the exterior of the tail member. A propulsion charge powder cartridge is mounted in the interior of the annular tail member and comprises an externally threaded element secured in the rear end of the annular tail member with a sleeve extending forwardly therein upon which an elongated tubular powder member is mounted.

3,789,764
EXPLOSIVE LEAD PLUG
Richard Stresau, Spooner, Wis., and Robert Bonde, St. Louis Park, Minn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 20, 1973, Ser. No. 333,578
Int. Cl. F42b 3/10
U.S. Cl. 102—70 R 1 Claim



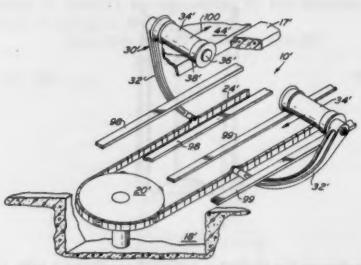
A metal fuze extension with an explosive-filled channel passing through it. The channel is small on one end and large on the other end with a conical section in the middle. A small conical insert fits into the conical portion of the channel. An opening extends from one end of the insert to the other allowing communication between the large and small ends of the channel. The large end of the channel is filled with an explosive charge. In the intended use of the extension, it is so positioned that the end containing the large diameter channel extends through the plate (usually steel) which forms the end of the canister. A detonation wave from a fuze located at the small end of the channel passes through the opening in the conical insert and causes detonation of the explosive material in the large end of the channel. The insert is then forced into the smaller end of the channel closing the smaller end of the channel and also the opening in the insert and the end of the plug is expanded so that the plug assumes the external configuration of a bottle stopper, preventing its ejection from the burster tube.

3,789,765
SWITCHING SYSTEM
Arthur P. Schultz, 9123 Rivershore Dr., Niagara Falls, N.Y.
Filed Oct. 26, 1972, Ser. No. 301,173
Int. Cl. E01b 25/06
U.S. Cl. 104—96 10 Claims



A displaceable rail section, normally forming a part of a transportation system's main rail, is bodily movable out of alignment with the main rail to effect a transfer of a vehicle from the main rail to branch rails deviating from the path of the main rail.

3,789,766
VEHICLE CONVEYOR
Paul D. Hurwitz, 1422 Redwood Ln., Wyncote, Pa.
Filed Feb. 22, 1972, Ser. No. 227,790
Int. Cl. B61b 13/12; B65g 19/22
U.S. Cl. 104—172 B 10 Claims



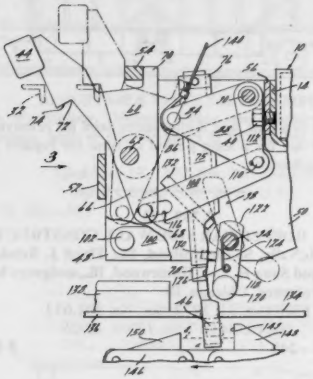
A vehicle conveyor suitable for a car wash is disclosed wherein tire-engaging rollers are attached to an endless chain positioned beneath the path of the vehicle. The rollers may selectively engage a tire on the vehicle or may selectively move along a path located at an elevation below the elevation of the tire. The tire-engaging rollers are supported as cantilevers from the chain. Slots are provided adjacent the ends of the chain so that the rollers may move up to a tire-engaging position and return to a lower position.

3,789,767

SUBFLOOR TOWLINE CONVEYOR SYSTEM

Robert Krammer, Farmington, Mich., assignor to Seatech Engineering, Inc., Southfield, Mich.

Filed Nov. 26, 1971, Ser. No. 202,198
Int. Cl. B65g 17/42
U.S. Cl. 104—172 BT 34 Claims



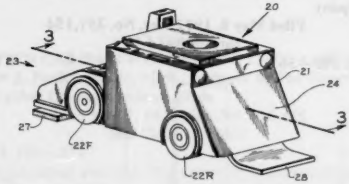
Disclosed is a subfloor towline conveyor system including a tow cart therefor having an improved tow pin actuating, controlling and locking mechanism. The mechanism includes a linkage system for controlling the movement of the tow pin to obtain power assisted engagement and disengagement with the towline conveyor, as well as improved means for positively locking the tow pin in a driven position and for manually locking the tow pin out of an operative position. There is also disclosed improved accumulating bumper means providing automatic accumulation of a plurality of such tow carts and also serving as a personnel safety bumper.

3,789,768

SLOT CAR TRACK CLEANING DEVICE

Jerry J. Broz, Scranton, Pa., assignor to Twinn-K, Inc., Indianapolis, Ind.

Continuation of Ser. No. 103,731, Jan. 4, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 303,699
Int. Cl. B24b 23/00
U.S. Cl. 104—279 8 Claims



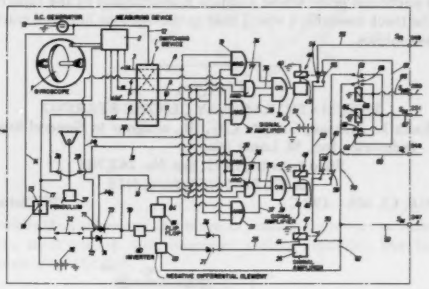
A slot car track cleaning device for removing foreign matter from the conductors and bed of the slot car track. A main body having wheels rotatably mounted thereon is propelled on the slot car track by an electric motor housed within the main body. Wipers contacting the track conductors are electrically connected to the motor. The motor rotatably drives the rear wheels of the slot car. An abrasive conductor cleaner projects from the slot car and contacts the track conductors. A petroleum distillate saturated wick extends from the rear of the slot car removing lint and other foreign material from the track. The wick extends out of a tank formed within the main body having cleaning liquid therein.

3,789,769

CAR STABLIZING CONTROL SYSTEM

Alfred Strohmer, and Joachim Rau, both of Munich, Germany, assignors to Knorr-Bremse GmbH, Munich, Germany

Filed Jan. 26, 1971, Ser. No. 109,830
Claims priority, application Germany, Jan. 26, 1970, P 20 03 374.3
Int. Cl. B60g 21/06; B61f 5/10, 5/24
U.S. Cl. 105—164 3 Claims



The air cushion suspension system of a railway vehicle is controlled to tilt the vehicle in the proper direction in response to a curvilinear path. Control signals are generated from a gyroscope in response to the curvilinear movement of the vehicle. In response to these control signals there are generated signals indicating angular acceleration and angular velocity of the vehicle about its vertical axis. A central switch generates two measurement signals responsive to the directions of deflection of the vertical central longitudinal plane of the vehicle from its vertical and the plane of the track. In response to the angular acceleration and velocity signals, direction actuating signals are generated from two pair of AND circuits connected to two OR circuits with the direction actuating signals controlling the air cushion suspension to tilt the vehicle in the proper direction when travelling a curvilinear path. There is also generated a blocking signal which is independent of the direction of turning. The measurement signals and the blocking signal are delivered to a switching means which unblocks the generation of the actuating signals when the blocking signal disappears. Two further AND circuits are connected to the switching means and the outputs of these AND circuits effect the release of actuating signals.

3,789,770

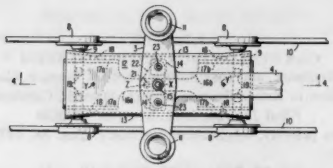
ARTICULATED RAILWAY TRUCK

Harold A. List, Bethlehem, Pa., assignor to Railway Engineering Associates, Inc., Bethlehem, Pa.

Continuation of Ser. No. 882,359, Dec. 15, 1969, abandoned, which is a continuation of Ser. No. 680,257, Nov. 2, 1967, abandoned. This application Feb. 2, 1972, Ser. No. 222,999
Int. Cl. B61f 3/08, 5/14, 5/38
U.S. Cl. 105—168 6 Claims

Two articulated railway truck assemblies for supporting and steering a railway vehicle, each comprising a main truck pivotally connected to the railway vehicle and two sub-trucks

pivotally connected to the main truck, at least one of the subtrucks also being pivotally connected to the railway vehicle at



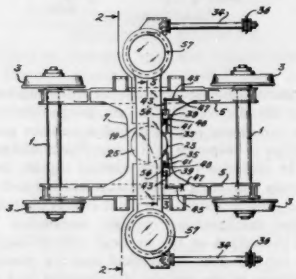
a particular point whose location is determined by the ratio of the truck assembly's wheel base to the distance between truck assemblies.

3,789,771

PNEUMATIC RAILWAY CENTER BEARING

Keith L. Jackson, Granite City, Ill., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed June 14, 1972, Ser. No. 262,788
Int. Cl. B61f *3/08, 5/10, 5/16*
U.S. Cl. 105—199 C **20 Claims**



A pneumatic center bearing for slidably supporting a railway vehicle body on a swivel truck has a horizontal pad of friction material between opposed horizontal surfaces of the truck and body parts for the purpose of damping oscillations of the truck about its swivel axis. To reduce frictional resistance offered by the friction pad when the vehicle is rounding curves, one of the surfaces is apertured and means is provided for introducing compressed air into the apertures responsive to swivel movements of the truck and thereby partly support the body by the compressed air and thus reducing friction between the body part of the bearing and the truck part.

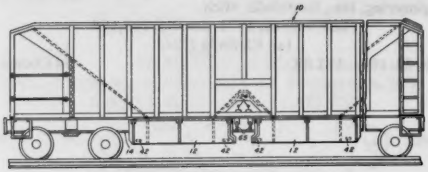
3,789,772

HOPPER CAR DOOR OPERATING AND LOCKING MECHANISM

Haran W. Bullard, 4228 Wilderness Rd., Birmingham, Ala.

Filed May 15, 1972, Ser. No. 253,078
Int. Cl. B61d *7/08, 7/18, 7/28*
U.S. Cl. 105—240 **11 Claims**

A hopper car door operating and locking mechanism for bottom opening containers is especially suited for use in railroad hopper cars. The mechanism comprises pneumatic cylinder actuated lever arms linked to the hopper doors. A positive force is required to either open or close the hopper doors. The mechanism is an assembly which can be removed



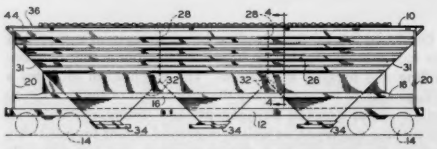
and installed as a unit, and it eliminates need for removing the car from service for a long period of time for repairs to the operating mechanism.

3,789,773

RAILWAY HOPPER CAR SIDE WALL CONSTRUCTION

George S. McNally, South Holland, Ill.; Floyd J. Brinks, Butler, Pa., and Sang H. Lee, Homewood, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 31, 1972, Ser. No. 302,613
Int. Cl. B61d *7/00, 17/06, 17/08*
U.S. Cl. 105—248 **8 Claims**



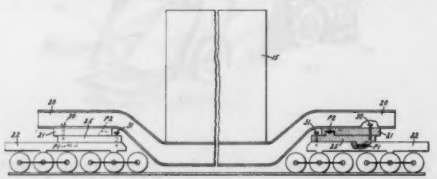
A railway hooper car having a folded plate side wall girder construction incorporating full length longitudinally extending corrugations having a generally trough shaped cross section to thereby form a side wall beam having vertical shear strength, transverse beam strength, as well as a high resistance to compressive stresses imposed by high buffing loads. Intermediate hopper partitions have stepped end portions to fit within the side wall corrugations.

3,789,774

TRANSPORT VEHICLE FOR LONG LOADS HAVING LIMITED LATERAL ROADWAY CLEARANCE

Stanley H. Wilk, Dalton, Mass., assignor to General Electric Company

Filed May 8, 1972, Ser. No. 251,154
Int. Cl. B61d *3/16*
U.S. Cl. 105—367 **4 Claims**



In a transport vehicle including a swiveled wheel truck, a flat bearing plate between the bolster platform of the truck and a bed plate of the vehicle frame provides two longitudinally spaced swivel pins, one between the bearing plate and the truck and the other between the bearing plate and the vehicle frame. Selectable locking means between the bearing

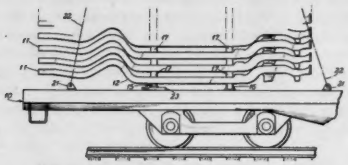
plate and truck and between the bearing plate and vehicle frame provide means for preventing swiveling movement about either swivel pin while enabling swiveling movement about the other. By this means longitudinal spacing between swivel pins at opposite ends of the vehicle may be adjusted to reduce lateral displacement of the vehicle midpoint on curved sections of roadway.

3,789,775

ADJUSTABLE PEDESTAL ASSEMBLY

Keith W. Broling, Olympia Fields, and Richard A. Tatina, Chicago, both of Ill., assignors to Portec, Inc., Oak Brook, Ill.

Filed May 17, 1972, Ser. No. 254,158
Int. Cl. B60p 7/08; B61d 45/00
U.S. Cl. 105—367 **7 Claims**



Adjustable pedestal assemblies for supporting stacks of automobile frames on the deck of a flat car. Each adjustable pedestal assembly forms a support for the rear end portion of the bottom frame of a stack of frames, and includes a channel-like base extending longitudinally of the car having parallel side walls and retainer flanges extending inwardly therefrom having inwardly opening notches spaced therealong. A pedestal block is supported on the channel-like base between the flanges thereof and is retained from tilting movement relative to the base by said flanges and is locked in position by a locking ring extending about the pedestal block. The locking ring has portions registrable with the notches in the flanges and is released from the notches by upward movement of the ring along the pedestal block, to accommodate movement of the pedestal block along the base in accordance with the length of frame to be supported.

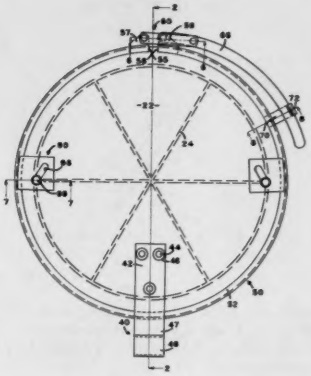
3,789,776

HOPPER CAR HATCH COVER AND LOCK ASSEMBLY

Donald J. Funk:y, Ionia, Mich., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Nov. 7, 1972, Ser. No. 304,445
Int. Cl. B61d 39/00
U.S. Cl. 105—377 **5 Claims**

A hatch cover and lock ring assembly is provided for use in sealing the hatch of a pressurized railroad hopper car, with the cover in sealing engagement with the upper lip of the coaming. There is a circular cover hingedly attached to the railroad car and having an elastomeric gasket attached to the bottom surface of the cover, adjacent its periphery to be compressible between the cover and the upper lip. An annular lock ring having end portions and a generally U-shaped cross section is held by retaining means in a uniform spaced relationship with respect to the cover. An over-center clamp mechanism is connected to the end portions of the lock ring and when locked, it draws the lock ring into tight sealing engagement about the cover and upper lip causing the cover to approach the upper lip, compressing the gasket therebetween for an air-tight uniform seal. The cover and lock ring assembly enables the use of a cover made from fiber reinforced plastic (FRP),



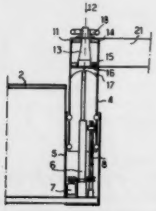
rather than a heavier and more expensive aluminum or stainless steel casting, with improved sealing capability and less labor time and skill.

3,789,777

PLANETARY TYPE DRAWING TABLE

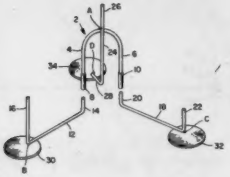
Claude Sautereau, 62, rue Saint-Lazare, Crepy-En-Valois, France

Filed Nov. 2, 1971, Ser. No. 194,855
Claims priority, application France, Nov. 3, 1970, 7039560; Sept. 21, 1971, 7133900
Int. Cl. A47f 5/12
U.S. Cl. 108—4 **5 Claims**



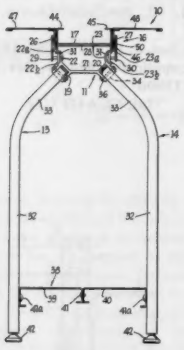
A drawing table of planetary type. The drawing board performs general rotational movements about a fixed pivot with vertical axis which acts as a support base, and rotational movements on itself about a vertical axis, in the manner of a planet around the sun. The table comprises a fixed pivot with vertical axis, referred to as a column, a radial arm, referred to as a support arm, which turns in a horizontal plane about said pivot, and a board which is mounted rotatably about a vertical axis at the end of the support arm.

3,789,778
MODULAR DISPLAY STAND
Charles S. Brand, Old Westbury, N.Y., assignor to Oberly & Newell, Inc., New York, N.Y.
Filed July 5, 1972, Ser. No. 269,143
Int. Cl. A47b 57/00
U.S. Cl. 108—94 12 Claims



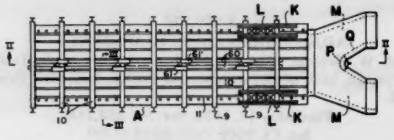
A modular display stand includes a plurality of trays supported at various levels so as to be eccentrically rotatable and arcuately displaceable for imparting a high degree of spacing flexibility to the stand.

3,789,779
DOCUMENT SORTING APPARATUS
Jack B. Guest, and Kathleen E. J. Guest, both of 119 Albury Dr., Pinner, England
Filed Jan. 3, 1972, Ser. No. 214,783
Claims priority, application Great Britain, Jan. 11, 1971, 1200/71
Int. Cl. A47b 57/00
U.S. Cl. 108—101 16 Claims



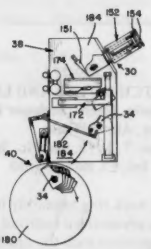
Document handling apparatus comprising an elongate and substantially rigid base mounted on four legs and an elongate carriage which is slidably mounted on the base. The carriage is formed with an elongate upwardly facing channel adapted to hold documents or alternatively to hold trays for documents and each end of the base is formed with two similar transversely spaced and longitudinally extending downwardly facing channels in which the upper end portions of the legs are located and mounted. The base is preferably formed with two upstanding longitudinally extending side walls and the carriage with two downwardly depending longitudinally extending side walls which overlap vertically with the upstanding side walls and rolling elements are mounted and contained between the upstanding and downwardly depending side walls enabling the carriage to be readily slidably moved on the base.

3,789,780
SUSPENDED ROOF AND END WALL CONSTRUCTION FOR REVERBERATORY FURNACE
Levi S. Longenecker, 61 Mayfair Dr., Pittsburgh, Pa.
Division of Ser. No. 182,409, Sept. 21, 1971. This application Dec. 29, 1972, Ser. No. 319,625
Int. Cl. F23m 5/04
U.S. Cl. 110—1 A 7 Claims



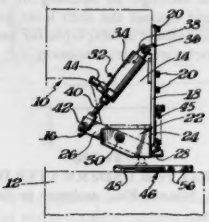
A refractory furnace construction is provided with a panelized roof using a hooked-on post or gooseneck type of suspension, as distinguished from a so-called piggy-back or cantilevered type. Each roof panel comprises a group of refractory tile members and their hanger castings constructed for unitized mounting within the roof construction. In addition to supporting metal structural framework, a cover assembly is provided to enable cleaning the upper surfaces of and, if desired, to provide a continuous cooling of the upper reaches of the refractory tile members of the roof. Refractory side wall parts converge towards each other and cooperate with a nose part to enclose an uptake end of the furnace. The nose part is constructed for unitized removal and insertion with respect to the side wall parts.

3,789,781
SEWING SYSTEM
Charles F. Carson; Carney J. Bryan, and Fred Birdsong, all of Greensboro, N.C., assignors to Blue Bell, Inc., Greensboro, N.C.
Filed Aug. 24, 1971, Ser. No. 174,351
Int. Cl. D05b 33/02
U.S. Cl. 112—121.29 7 Claims



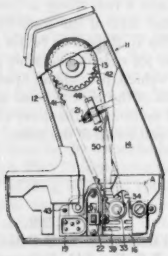
Apparatus for the sewing of preformed fabric blanks into garment components includes first and second stitch machines for sewing and controlling the fabric in a prescribed manner and a mechanism for collecting and stacking the sewn fabric. Each stitch machine includes means for positioning and aligning preselected edge portions of fabric in a prescribed manner. The fabric is directed in a predetermined path of travel relative to sewing instrumentalities to stitch selected portions to form a garment component.

3,789,782
SEWING MACHINE CUTTER
Billy L. Speer, Campbellsville, Ky., assignor to Spear Systems, Inc., Campbellsville, Ky.
Filed Jan. 17, 1972, Ser. No. 218,148
Int. Cl. D05b *37/04*
U.S. Cl. 112—130 4 Claims



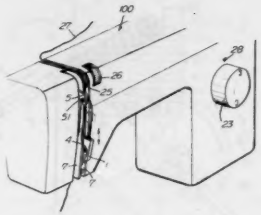
Sewing machine includes flat bed and cutting assembly includes mounting plate secured to machine with blade mounting arm integral with plate. Movable cutter blade is connected to arm and motivator between blade and mounting plate moves blade toward and away from flat bed of sewing machine. Stationary cutter blade is adjustably secured to flat bed of sewing machine and has cutting edge thereon arranged so that movable cutter blade sweeps across cutting edge of stationary blade when motivator is activated. Special mounts are provided for adjustably securing stationary cutter blade to bed of sewing machine so that stationary blade is adjustable for precise alignment of blade relative to movable blade.

3,789,783
SEWING MACHINE AND MOTOR SPEED REGULATING SYSTEM THEREFOR
Albert N. Cook, 6 Stonehedge Ln., Madison, N.J.; Lawrence R. Goetz, Rt. 3, Box 647, Monticello, Ind.; Paul A. Manley, 1355 Brookfall Ave., Union, N.J., and Joseph P. Yelpo, 28 Galaway Pl., Boonton, N.J.
Filed June 1, 1973, Ser. No. 366,227
Int. Cl. D05b *69/12*
U.S. Cl. 112—220 15 Claims



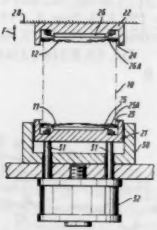
A sewing machine having a solid state-controlled rectifier motor speed regulating system which includes a motor control module having electrical circuit components, a remotely located motor speed controller and switching means on the machine cooperably connecting said controller and circuit components through electrical circuitry incorporated in an end support base of a split housing for the motor. The end support base is adapted to mount the motor and motor control module and to also operably complete the electrical circuitry for the speed regulating system.

3,789,784
SEWING MACHINE
Susumu Hanyu, No. 1100, Higashi-machi, Sanda, and Noboru Kasuga, No. 767-25, Kami-Ichibunkatamachi, both of Tokyo, Japan
Filed June 22, 1972, Ser. No. 266,526
Claims priority, application Japan, June 22, 1971, 46/44513
Int. Cl. D05b *49/00*
U.S. Cl. 112—246 7 Claims



A thread take-up lever is reciprocable in vertical direction and receives thread from a thread tensioning device. Intermediate the take-up lever and the tensioning device the thread is supplied to a thread guide which is displaceable in parallelism with the movement of the take-up lever between an upper and a lower position. A dial is movable to at least two positions and is connected with the thread guide by linkage means so that the thread guide moves between its upper and lower positions in dependence upon the movement of the dial to the respective positions of the latter. Depending upon whether the thread guide is in its upper or lower position the amount of thread supplied to the take-up lever is varied, that is it is either increased or decreased.

3,789,785
STERILISATION OF TINS
Maurice Petit, deceased, late of Paris, France, and Georges Thomas, Ville-D Avray, France, assignors to Ets J.J. Carnaud & Forges De Basse-Indre, Paris, France
Division of Ser. No. 886,585, Dec. 9, 1969, Pat. No. 3,704,140.
This application Sept. 17, 1971, Ser. No. 181,356
Int. Cl. B21d *51/26*
U.S. Cl. 113—1 G 17 Claims



To prevent bursting of a can due to the vacuum formed therein on cooling after sterilisation a part of the can, generally an end thereof, is subjected to a permanent deformation, effected before the can is fully cooled, which reduces the internal volume of the can.

3,789,786

DEVICE FOR APPLYING AN ELONGATED RIBBED STRIP TO THE EXTERIOR OF A ROTATING CONDUIT

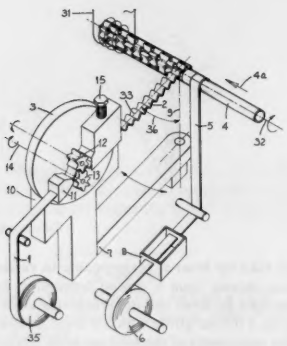
Konrad Wiedenmann, Staufenring, and Peter Prelisauer, Hafenbad, both of Germany, assignors to Wieland-Werke AG, Ulm, Germany

Filed Mar. 1, 1972, Ser. No. 230,640

Claims priority, application Germany, Mar. 4, 1971, P 21 10 306.0

Int. Cl. B21d *53/00*

U.S. Cl. 113—1 C **12 Claims**



A device for the manufacture of externally ribbed heat transfer conduits and/or cores insertable into conduits to provide internally ribbed heat transfer conduit. Means for converting a smooth ribbon into a corrugated ribbon are mounted on a tool holder which in turn is mounted on means pivotable around an axis perpendicular both to the elongated direction of the corrugated ribbon and to the axis of the conduit, or core as the case may be. This pivoting is to enable the ribbon to be wrapped around the conduit, and/or core, in close side to side abutment of the several wraps with respect to each other. The wrapping angle is adjustable from about 45° to about 135° with the 90° position being chosen corresponding to the angle required for a conduit or core approximately midway between the size extremes which a given machine is to handle. A given tool holder and the tools mounted thereon are readily replaceable by lifting one tool holder off the driving gears provided therefor and replacing it with another tool holder.

3,789,787

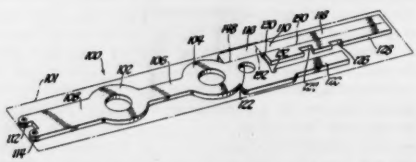
METHOD OF MANUFACTURING A GEARSHIFT AND DETENT PLATE BRACKET

Thomas J. Milton, 313 Cornell St., Bay City, Mich.

Division of Ser. No. 194,173, Nov. 1, 1971, Pat. No. 3,748,921. This application Jan. 26, 1973, Ser. No. 326,796

Int. Cl. B21d *53/88*

U.S. Cl. 113—116 R **2 Claims**



The steering column-mounted shift mechanism shown includes a rotatable stamped shroud secured to a stamped gearshift and detent plate bracket which, in turn, is operatively connected to the usual shift or control tube. The bracket is formed from a flat blank to include a pair of spaced end rings with an interconnecting strap member and having a support for the pivotal mounting of a shift lever formed on a side of one of the end rings and a bracket with a pair of arcuate mounting flanges formed on a side of the other end ring in spaced parallel relationship. The arcuate flanges are secured to an inner surface of the shroud and one of the flanges includes notches suitable for cooperation with a sliding rack of the usual steering column lock system. A shift lever biasing spring is mounted through an opening in the bracket and retained at one end against the shift lever pivotal mounting support. This arrangement is adaptable for use with either an automatic or a synchromesh transmission.

3,789,788

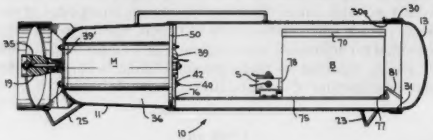
BODY SEAL FOR UNDERWATER DEVICE

George J. Peroni, Miami, Fla., assignor to Seatech Corporation, Miami, Fla.

Division of Ser. No. 28,476, April 14, 1970, Pat. No. 3,685,480. This application Nov. 19, 1971, Ser. No. 200,452

Int. Cl. B63b *21/56*

U.S. Cl. 114—16 A **3 Claims**



Heat from the motor of a sealed underwater vehicle is transferred and dissipated through direct heat transfer paths having sufficient heat transfer capacity to permit the continuous operation of the motor at a safe temperature. The direct transfer path includes an annular disc that supports the rear of the motor and also reinforces the interior of the shell-like body of the vehicle; further reinforcement being provided by the fit of the battery in the vehicle. The nose cone is welded to a standard pipe and a rear dome is removably mounted and sealed to the other end of the pipe by a stretchable elastic band. A spring clip is utilized to retain the internal operating assembly together for ease of assembly and disassembly. Control grips for the vehicle provide an open grip by the diver and distribute the bulk of the pulling force across the length of the second and third sections of the diver's fingers and by friction to the full length and width of the palm.

3,789,789

HYDROFOIL SAILING CRAFT

James M. Cleary, P.O. Box 541, Falmouth, Mass.

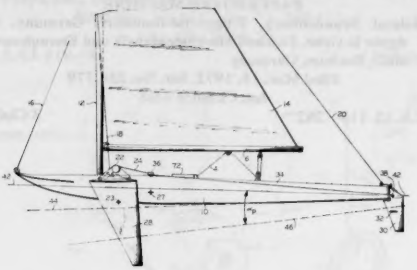
Filed Mar. 23, 1972, Ser. No. 237,414

Int. Cl. B63b *1/18*

U.S. Cl. 114—66.5 H **25 Claims**

A hydrofoil sailing craft having a hydrofoil assembly comprising an outrig pivotally mounted on the hull of the craft and a pair of swept-back hydrofoils mounted on each end of the outrig, an elastic restraint attached to the outrig and to a control shaft mounted on the hull of the craft whereby the foils are permitted to pivot through an angle which is controlled by the combined effects of the elastic restraint and the rearward shift of the lift center on the hydrofoils as they rise from the

water. Means are also provided for adjusting the tension on the elastic restraint and for pivoting the hydrofoils inwardly to



adjust the angle of the hydrofoils with respect to the outrig and ultimately to fold the hydrofoils against the outrig for transport.

3,789,790

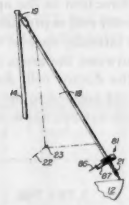
SYSTEM FOR REEFING AND FURLING SAILS

Donald H. Crall, 1580 Oleander, Chula Vista, Calif.

Continuation-in-part of Ser. No. 198,707, Nov. 15, 1971, Pat. No. 3,749,043. This application June 1, 1973, Ser. No. 366,173

Int. Cl. B63h *9/04*

U.S. Cl. 114—106 **10 Claims**



Spool sections are rotatably mounted on the jib stay. Each section is formed of two identical halves which are fixed together by screws or clips. The two parts in cross-section are formed with a central hole which receives the stay. A bore is formed on one side and connected to the exterior by a first slot. A smaller second bore has a second slot to the exterior. The luff of a sail and its luff rope fit in one large bore, the luff extending out the first slot. The luff rope extends up over a pulley in a crown block above the highest spool section, then down through the first bore on the opposite half. Thus the sail may be rapidly installed. Pins fit into the second bores of adjacent spool sections, holding them for rotation together. A drum consisting of two sections screwed together and fixed to the lowermost spool section receives a furling line used to revolve the spool sections and furl or reef the sail.

3,789,791

CHEMICAL HULL PATCH

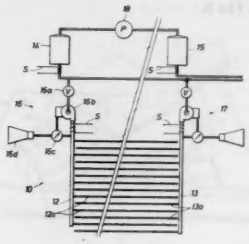
Robert R. Lent, Houston, Tex., and Francis G. Firth, El Segundo, Calif., assignors to Tenneco Oil Company, Houston, Tex.

Filed Apr. 12, 1971, Ser. No. 133,255

Int. Cl. B63b *23/16*

U.S. Cl. 114—227 **23 Claims**

A system and method in which in a preferred form, a network of breakable conduits are secured to the internal confining surfaces of a fluid containing structure such as the compartment walls of an oil tanker. The conduits are adapted to be broken upon rupture of the containing walls whereupon one or more reactive chemical agents are forced through the ruptured conduit system and are discharged into the confines of the structure in the area of the rupture where they react to



form a solid or semi-solid mass of limited size. The resulting mass forms a localized blockage which reduces or terminates flow of the contained fluid through the point of rupture. Automatic control systems may be employed to initiate and terminate flow of the reactive agents through the pipe network.

3,789,792

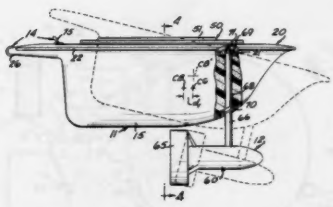
MOTORIZED SWIMMING AID

David P. Smith, 3909 Campbellton Rd., S.W. Apt. E-9, Atlanta, Ga.

Filed Feb. 3, 1972, Ser. No. 223,226

Int. Cl. A63c *11/10*

U.S. Cl. 115—6.1 **4 Claims**



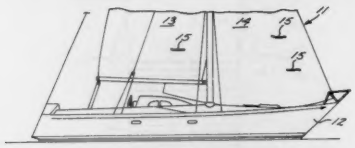
A motorized swimming aid including a boat shaped hull with a pair of handles at the rear end thereof to be grasped by a swimmer and be pulled along the surface of the water. The center of gravity of the swimming aid is located within the hull laterally aligned with and longitudinally spaced from the center of buoyancy to generate a moment of force on the hull to lift the handles out of the water. A motor is attached to the hull to generate a moment of force on the hull when it is operating to force the handles toward the surface of the water. The motor is powered by two batteries selectively connectable to the motor in parallel or in series to vary the operating speed of the motor.

3,789,793

METHOD OF DETECTING WIND AT A MID-POINT OF A SAIL AND MEANS THEREFOR

Melville Keim, 933 via Lido Soud, Newport Beach, Calif.

Filed Nov. 21, 1972, Ser. No. 308,311
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 R 17 Claims



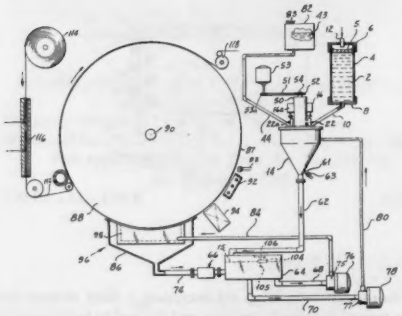
Wind indication and direction may be sensed by a flexible strip attached to the surface of a sail. A button member and a reception member attach the flexible strip to a selected point on the sail. A pair of flexible strips may be attached on opposite sides of the sail to indicate the presence and direction of wind from vantage points on either side of the sail.

3,789,794

APPARATUS FOR DEVELOPING ELECTROSTATIC IMAGES

Ian Edward Smith, Lockleys, South Australia; Peter John Hastwell, Elizabeth Grove, South Australia, and Marinus Cornelius Vermeulen, Valley View, South Australia, all of Australia, assignors to Savin Business Machines Corporation, Valhalla, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,155
Int. Cl. G03g *13/10*
U.S. Cl. 118—7 12 Claims



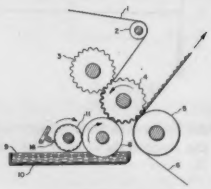
An electrostatic copier includes means to recirculate developer comprising a diluent carrier and a tacky toner, between a developer supply tank and a developer station. A recirculation system communicates a mechanical mill with the supply tank. Means monitoring developer level in the supply tank and opacity of the developer material control the respective feeds of carrier and toner to the mill.

3,789,795

GLUE-APPLYING APPARATUS FOR CORRUGATED PAPERBOARD MACHINE

Helmut Brandenburg, Wuppertal-Ronsdorf, Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei mbH, Bochum, Germany

Filed Mar. 15, 1972, Ser. No. 234,779
Int. Cl. B05c *1/08*
U.S. Cl. 118—262 3 Claims



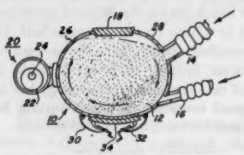
A smooth surface applicator roll dips into glue in a vat and applies the glue to the crests of the corrugations of a corrugated paper web traveling around a support roll above the vat. A doctor roll is located beside the applicator roll above the glue level in the vat and is pressed against the side of the applicator roll that carries glue upwardly. The doctor roll is rotated in the same direction as the applicator roll to remove glue from it. The doctor roll is provided with grooves extending around it so that laterally spaced strips of glue are left on the applicator roll between the areas of the latter from which glue is removed by the doctor roll. As a result, longitudinally spaced areas of glue are applied to the crest of each paper corrugation by the smooth surface applicator roll.

3,789,796

APPARATUS FOR PRODUCING DEVELOPER MATERIAL

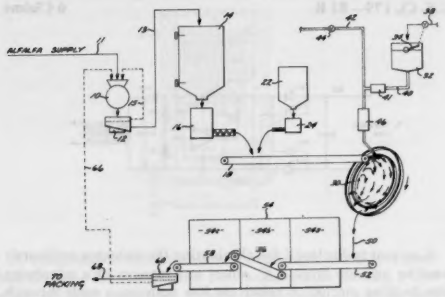
Robert W. Madrid, Macedon, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 585,875, Oct. 11, 1966, abandoned. This application Jan. 20, 1971, Ser. No. 107,913
Int. Cl. G03g *13/08*
U.S. Cl. 118—612 7 Claims



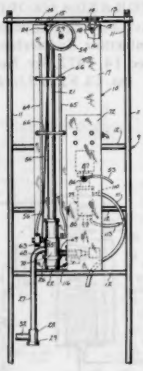
Carrier beads for electrostatographic developer mixtures having substantially smooth surfaces and having finely divided particulate material imbedded in a softenable surface are made by softening the external surface of the bead material and contacting the softened bead with finely divided particulate material and subjecting the beads to multiple collisions with other beads.

3,789,797
CAT LITTER
Andrew I. Brewer, Los Angeles, Calif., assignor to Star-Kist Foods, Inc., Terminal Island, Calif.
Filed Nov. 12, 1971, Ser. No. 198,112
Int. Cl. C05f 5/00
U.S. Cl. 119—1 11 Claims



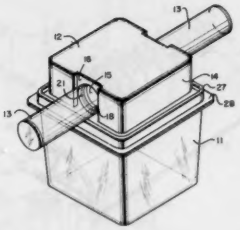
An animal litter prepared from a mixture of alfalfa, bentonite and a binder for absorbing and neutralizing the odors of animal waste matter.

3,789,798
AUTOMATIC MILKING UNIT
Rolf W. Reisgies, Madison, and Franklin B. Jones, Delavan, both of Wis., assignors to Sta-Rite Industries, Inc., Delavan, Wis.
Filed Aug. 10, 1972, Ser. No. 279,337
Int. Cl. A01j 5/04
U.S. Cl. 119—14.08 27 Claims



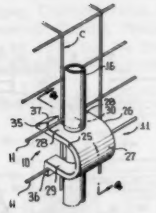
An automatic milking unit to be associated with a milking stall or palor. The milking unit includes a vertical shaft and a housing is mounted for sliding movement on the shaft and carries an arm that supports a milking claw. The housing is biased upwardly to a storage position and when manually lowered, it follows a cam track which rotates the milking claw to a position beneath the cow's udder and is locked in the lowered position. The milking claw is connected by a hose to a milk receptacle adjacent the stall and an automatic release mechanism is incorporated with the receptacle so that the vacuum to the claw and teat cups will be automatically shut off when the milk flow ceases. Cessation of the milk flow releases the teat cups and also acts to unlock the housing so that the arm and claw will be urged upwardly to the storage position.

3,789,799
EDUCATIONAL OBSERVATORY
John B. Orfei, Revere, Mass., assignor to American Science & Engineering, Inc., Cambridge, Mass.
Filed Oct. 12, 1971, Ser. No. 188,087
Int. Cl. A01k 01/00
U.S. Cl. 119—15 2 Claims



An educational observatory includes a dish-shaped base member of thermoplastic material formed with circular sidewall openings with recessed and reinforced sockets for accommodating transparent vials which may be detachably secured to these sockets. Each socket has a flange with a radial length greater than the thickness of the sidewall for bonding to the inside of the sidewall. The socket forms a seat for one end of the vial, and the ridge means between the sidewall opening and vial seat engages lip means on the vial to prevent its accidental removal from the socket. A transparent hood matingly engages an edge portion of the circumferential wall of the dish-shaped base member.

3,789,800
WATER FOUNTAIN SYSTEM
Frederick W. Steudler, Jr., Lancaster, Pa., assignor to The Vallorbs Jewel Company, Lancaster, Pa.
Filed Apr. 24, 1972, Ser. No. 246,989
Int. Cl. A01k 07/00
U.S. Cl. 119—18 18 Claims



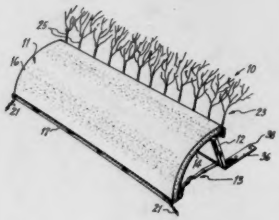
This disclosure relates to a novel system for suspending water fountains for mass poultry watering, and is particularly directed to means for coupling the supporting member of a water fountain to horizontal wires of a poultry cage, the coupling means being a clip having a bight portion and two pairs of spaced resilient legs whose ends are clamped to the wires and between each pair of legs is a slot for supportingly embracing the water fountain supporting member. Another clip is of a closed loop configuration defined by a pair of legs common to two bight portions which embrace a pair of water fountain supporting members, the clip being not only adjustable vertically with respect to a cage but also adjustably carries a support for a conventional water pipe.

3,789,801

PORTABLE, COLLAPSIBLE STEEPLECHASE HURDLE OR FENCE

Joseph H. Moreng, Ridgefield, N.J., assignor to Joseph Moreng Iron Works, Inc., Ridgefield, N.J.

Filed Jan. 5, 1973, Ser. No. 321,334
Int. Cl. A01k 15/00
U.S. Cl. 119—29 10 Claims



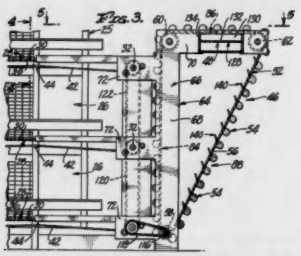
A portable, collapsible steeplechase hurdle or fence comprises a barrier member of light weight, reinforced construction which is adapted to rest on the ground, at one longitudinal edge, in the erected condition and which is preferably curved in the direction toward the opposite or uppermost longitudinal edge, support legs pivoted in back of the barrier member to swing between erected positions, in which the legs extend downwardly from the uppermost edge of the barrier member for engagement with the ground, and stored positions in which the legs lie against the barrier member, and bracing link members pivotally connected to the barrier member and legs and being movable between extended and collapsed positions respectively corresponding to the erected and stored position of the legs, with such bracing link members being automatically retained in either their extended or collapsed positions for preventing inadvertent displacement of the legs from either their erected or stored positions, respectively.

3,789,802

AUTOMATIC POULTRY EGG COLLECTOR

John L. Conley, 3870 Chino Ave., Chino, Calif.

Filed May 12, 1971, Ser. No. 142,511
Int. Cl. A01k 31/14
U.S. Cl. 119—48 17 Claims



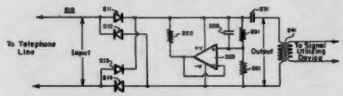
An automatic egg collector for an automated poultry handling system having a poultry cage battery composed of tiered banks of poultry cages with inclined floors along which eggs roll from the cages onto feeder conveyors alongside the cage tiers. The several feeder conveyors of each cage bank feed a common transfer conveyor which transfers eggs from the feeder conveyors to an overhead outfeed conveyor. The outfeed conveyor transports the eggs from all the transfer conveyors of the cage battery to an egg receiver.

3,789,803

INDUCTOR-LESS TELEPHONE LINE HOLDING CIRCUIT GIVING HIGH A.C. SHUNT IMPEDANCES

Steven J. Davis, Ridgefield, and Stephen L. Domyan, Bridgeport, both of Conn., assignors to General Datacomm Industries, Norwalk, Conn.

Filed Nov. 15, 1971, Ser. No. 198,789
Int. Cl. H04m 1/00
U.S. Cl. 179—81 R 6 Claims



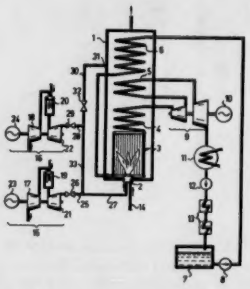
A circuit is disclosed for eliminating the inductor ordinarily used to provide large A.C. shunt impedances in a telephone line holding circuit. A relatively low resistance path through the output of an amplifier and one of its voltage supply inputs shunts the input of the line holding circuit. The input is also shunted by a phase shifting and voltage dividing network that phase shifts the input A.C. signal to cause the current signal to lead the voltage signal. The phase shifted signal is applied to the input of the amplifier. The amplifier has a gain of one and the voltage of the signal applied to it approaches the voltage at the input to the circuit. As a result, the A.C. signal voltage at the output of the amplifier has a magnitude and phase relation with respect to that of the input signal that produces a high A.C. shunt impedance.

3,789,804

STEAM POWER PLANT WITH A FLAME-HEATED STEAM GENERATOR AND A GROUP OF GAS TURBINES

Emile Aguet, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Dec. 14, 1972, Ser. No. 314,963
Int. Cl. F22b 33/18
U.S. Cl. 122—1 R 7 Claims



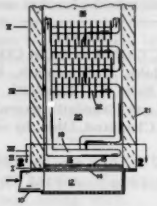
At least two gas turbine groups of identical construction are selectively connected to the burner of the steam generator. If one group fails, the other group takes over to deliver the combustion air necessary to continue efficient operation without an interruption in service. In normal operation, one gas turbine group is connected to the burner while the other is connected at a mixing location in the steam generator, e.g. between the preheater and a superheater.

3,789,805

BURNER AND HEAT EXCHANGER

Glenn C. Williams, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 17, 1972, Ser. No. 254,001
Int. Cl. F22b *21/22*
U.S. Cl. 122—235 R 5 Claims



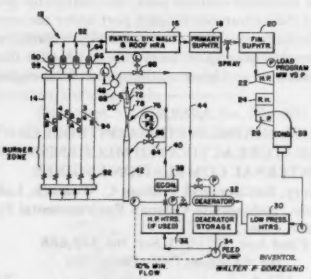
A combination burner and heat exchanger has a first combustion zone for hot gaseous flow adjacent the burner, a first stage of heat exchanger in and terminating this zone and adapted to cool the flow to a temperature too low to support formation of certain undesired components therein but sufficiently high to support combustion of other undesired components, a second combustion zone, longer than the first, wherein the flow is maintained at a temperature sufficiently high to support such combustion, and a second stage of heat exchanger wherein the flow exiting the second combustion stage is cooled below the combustion temperature.

3,789,806

FURNACE CIRCUIT FOR VARIABLE PRESSURE ONCE-THROUGH GENERATOR

Walter P. Gorzegno, Florham Park, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed Dec. 27, 1971, Ser. No. 211,899
Int. Cl. F22d *7/00*
U.S. Cl. 122—406 R 28 Claims



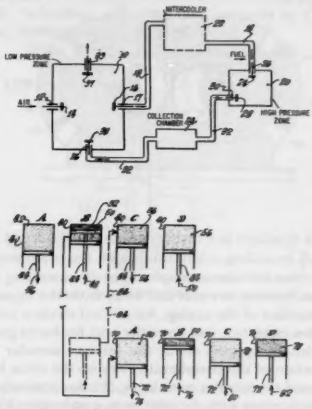
A variable pressure vapor generator of the once-through type in which circulation is established at normal loads by the generator feed pump. However, at start-up and loads below about 50 percent, evaporation in the generator furnace enclosure is carried out only to a vapor-liquid mixture. At least a minimum flow, for instance about 10 percent flow, is maintained by the generator feed pump, and circulation in the furnace enclosure is established by natural recirculation of the liquid portion of the vapor-liquid mixture, assisted by the feed pump flow. By the invention, turbine throttle pressure is varied in response to load demand, and fluid pressure within the vapor generator circuit is varied essentially in step with the throttle pressure.

3,789,807

DUAL COMBUSTION PROCESS FOR AN INTERNAL COMBUSTION ENGINE

James David Pinkerton, 12689 Cometa Ave., Sylmar, Calif.

Filed June 19, 1972, Ser. No. 264,201
Int. Cl. F02b *75/12*; F01k *27/00*; F02m *25/06*
U.S. Cl. 123—1 R 22 Claims



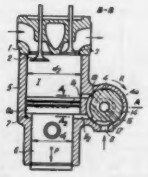
An internal combustion process in which fuel is twice combusted before leaving the system. Air is compressed in a low pressure cylinder with some of this compressed air being withdrawn and injected, with or without cooling, into a high pressure cylinder where it is further compressed and combusted with fuel in a highly fuel rich mixture. The exhaust gases from the high pressure cylinder are withdrawn from the latter and flowed into a reservoir chamber from which they are intermittently withdrawn and injected into the low pressure cylinder for mixture and combustion with the compressed air in the latter cylinder. The foregoing steps are repeated after the exhaust gases are purged from the low pressure cylinder.

3,789,808

SUPERCHARGING COMBUSTION ENGINES

Antonin Richter, Prague, Czechoslovakia, assignor to Ustav pro vyzkum Motorovych Vozidel, Praha, Czechoslovakia

Filed June 20, 1972, Ser. No. 264,462
Claims priority, application Czechoslovakia, July 2, 1971, 4880/71
Int. Cl. F02b *33/14*
U.S. Cl. 123—71 R 7 Claims



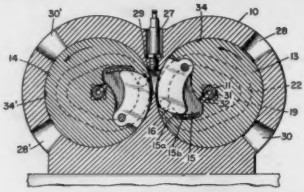
Method and Apparatus for supercharging the cylinder, wherein additional air is compressed in two stages and only delivered to the cylinder in bulk during the suction stage of the working cycle. In the expansion stage the compressed air is diverted to the other cylinders and only a portion of the compressed air is delivered to the cylinder and only at the end of the expansion stroke.

3,789,809

ROTARY INTERNAL COMBUSTION ENGINE

Emil Georg Schubert, 4210 Kenyon Ave., Los Angeles, Calif.

Filed May 1, 1972, Ser. No. 248,863
Int. Cl. F02b *53/04*
U.S. Cl. 123—8.05 **6 Claims**



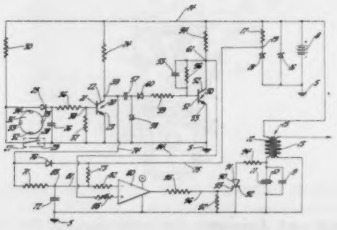
A rotor is mounted in a casing defining a cylindrical annular interior wall in sealing relationship with the periphery of the rotor. The rotor includes a peripheral cavity mounting a piston for radial movement towards and away from the opposed annular wall surface of the casing. An air-fuel mixture inlet port, a combustion chamber, and an outlet port for burnt gasses are circumferentially spaced about the interior annular wall so that the portion of the peripheral cavity on the rotor between the piston and the interior annular wall is successively placed into communication with the inlet port, combustion chamber, and outlet port as the rotor rotates. A cam arrangement connects the piston with a cam surface on the interior of the casing so that movements of the piston towards and away from the opposed interior annular wall are guided. A fresh air inlet in turn communicates with the peripheral cavity portion under the piston and includes a check valve so that outward movement of the piston draws in fresh air and inward movement compresses the air. The cavity is shaped such that complete inward movement of the piston exposes an outlet portion so that the compressed air can circulate around the piston. With this arrangement, the fuel-air inlet mixture is supercharged by the compressed air during a portion of the compression stroke of the piston and the burnt gasses are in turn purged by the fresh air during an exhaust stroke of the piston. The fresh air inlet also provides cooling for the piston and rotor.

3,789,810

INTERNAL COMBUSTION ENGINE SPEED LIMITING CIRCUIT

Walter J. Sattler, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 14, 1972, Ser. No. 271,783
Int. Cl. F02m *51/00*
U.S. Cl. 123—102 **6 Claims**



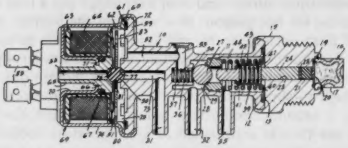
An internal combustion engine speed limiting circuit. A direct current sawtooth waveform potential signal having a substantially constant maximum magnitude is applied to the inverting input circuit of a conventional operational amplifier and a direct current engine speed potential signal which increases linearly in magnitude with engine speed is applied to the non-inverting input circuit of the operational amplifier. The operational amplifier produces an output direct current control potential signal while the magnitude of the engine speed potential signal exceeds the magnitude of the sawtooth waveform potential signal which is applied across the gate-cathode electrodes of a silicon controlled rectifier, the anode-cathode electrodes of which are connected in shunt across the conventional ignition distributor breaker contacts.

3,789,811

EMISSIONS REDUCTION VACUUM CONTROL VALVE

Rudolph J. Franz; John S. Freismuth, both of Arlington Heights, Ill., and Nello L. Benedetti, deceased, late of Prospect, Ill. (by Lena Benedetti, executrix), assignors to Eaten Corporation, Cleveland, Ohio, by said Franz and Freismuth

Filed Nov. 3, 1971, Ser. No. 195,239
Int. Cl. F02p *5/04*; **F16k** *17/38*
U.S. Cl. 123—117 A **10 Claims**



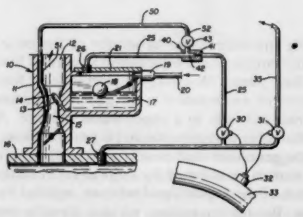
Spark advance vacuum control valve arranged to reduce the emission of noxious gases from the internal combustion engines of automotive vehicles. A solenoid energized by an electric switch in association with the transmission operates a valve effective to vent the distributor to atmosphere as the engine is started and the transmission is shifted into high gear. When the transmission is in high gear, the solenoid is deenergized to connect the distributor to effect advance of the spark by carburetor vacuum. A manifold port, distributor port and vent port lead into the valve housing through a wall of the housing while the carburetor port is at an end of the valve housing. A valve chamber within the housing has communication with the manifold vacuum port, the distributor port, the vent port and the carburetor vaccum port under the control of a thermally responsive valve. The thermally responsive valve is operated by overheating of the engine to advance the spark by manifold vacuum and increase the speed of the engine.

3,789,812

AIR/FUEL MIXING SYSTEM CONTROLLED BY TEMPERATURE ACTIVATED MECHANISM FOR INTERNAL COMBUSTION ENGINES

James M. Berry, Boulder, and William C. Womack, Lafayette, both of Colo., assignors to Colspan Environmental Systems, Inc., Boulder, Colo.

Filed Apr. 10, 1973, Ser. No. 349,686
Int. Cl. F02m *7/00*; **F02p** *5/00*
U.S. Cl. 123—117 A **7 Claims**



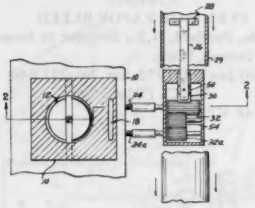
An improvement in air/fuel mixing systems controlled by temperature activated mechanism for internal combustion en-

gines, embodied in air/fuel mixing means which permit the carburetor to be initially adjusted for efficient economical performance to maintain a variable nearly perfect air/fuel mixture for combustion under a wide range of operating conditions by varying the pressure in the float bowl of the carburetor, achieved by connecting a vacuum source to the carburetor float bowl by a vacuum conduit whereby the difference between the pressure in the fuel bowl and the pressure in the Venturi throat of the carburetor is reduced. The temperature activated mechanism is incorporated into the mixing system and provides an automatic over-temperature safety cutout device which is a thermal vacuum valve that simultaneously disables the main air/fuel mixing system and enables the distributor advance upon sensing an over-temperature condition.

3,789,813
FUEL MIXTURE CONTROL

Duane A. Hunt, East Lansing, Mich., assignor to Donnell R. Matthews, Jr., East Lansing, Mich.

Filed May 22, 1972, Ser. No. 255,761
Int. Cl. F02m *1/10*
U.S. Cl. 123—119 F **9 Claims**

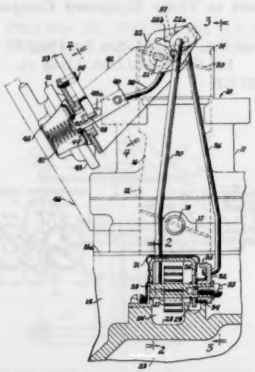


Means responsive to the temperature of the engine are employed to adjust the flow of fuel in the carburetor to regulate the mixture during normal operation of the engine. In addition, means are preferably provided which also effect an automatic adjustment of the fuel flow to the engine in accordance with variations in atmospheric pressure such as occurs at different elevations.

3,789,814
AMBIENT TEMPERATURE REGULATED CHOKE

Ronald F. Gillham, Huntington Woods, and Ward W. Wiers, Washington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 14, 1972, Ser. No. 289,003
Int. Cl. F02m *1/10*
U.S. Cl. 123—119 F **8 Claims**

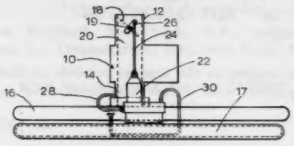


An ambient temperature regulated choke mechanism for a carburetor is provided with temperature actuated means whereby the choke pull angle, the angle the choke valve attains after the engine starts, and the time required to achieve wide open choke are modulated by ambient temperature.

3,789,815
TEMPERATURE RESPONSIVE CONTROL DEVICE

Louis W. Schreiner, Palatine, Ill., assignor to Charles M. Carter, Northbrook, Ill., a part interest

Filed Feb. 17, 1971, Ser. No. 116,008
Int. Cl. F02m *1/10*; **F01b** *21/00*
U.S. Cl. 123—119 F **10 Claims**

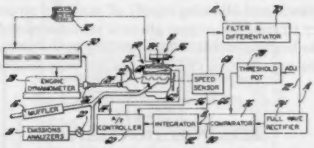


A device for controlling the movement of a control member between first and second positions in accordance with a varying temperature condition and a power condition generated by a temperature-power source. The device includes means responsive to the varying temperature condition and the power condition for driving the control member between the first and second positions so that (1) the control member is driven to the first position when no power condition is generated and the temperature condition is below a prescribed level, (2) the control member is driven toward the second position as a function of the temperature condition when the power condition is generated, and (3) the control member is driven to a prescribed intermediate position between the first and second positions when the temperature condition is at or above the prescribed level and the power condition is terminated.

3,789,816
LEAN LIMIT INTERNAL COMBUSTION ENGINE ROUGHNESS CONTROL SYSTEM

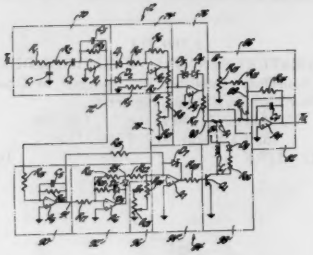
Lael B. Taplin, Livonia; William R. Seitz, and Chun Keung Leung, both of Farmington, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 29, 1973, Ser. No. 346,240
Int. Cl. F02d *5/00*; **F02m** *51/00, 57/00*
U.S. Cl. 123—119 R **15 Claims**



A closed loop fuel control mechanism for controlling the air fuel mixture delivered to an internal combustion engine so as to regulate the roughness of the engine at a predetermined level. The control system receives as input signal a signal indicative of the engine roughness and processes this signal to

generate an output control signal for controlling the fuel delivery mechanism of the internal combustion engine to



operate that engine at the leanest possible air/fuel mixture ratio compatible with a predetermined level of engine roughness.

3,789,817

ANTI-POLLUTION SUPPLY DEVICE FOR INTERNAL COMBUSTION ENGINES

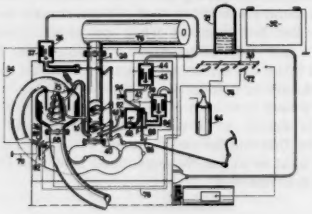
Marcel Morel, 14 Mesnil Clinchamps, and Lucien Lepareur, 49, Avenue de la Gare, Vire, both of France

Filed Apr. 28, 1972, Ser. No. 248,645

Claims priority, application France, Apr. 30, 1971, 71.15575

Int. Cl. F02m *1/08, 31/12, 31/14*

U.S. Cl. 123—133 **7 Claims**



Anti-pollution supply device for an internal combustion engine which comprises an air intake pipe, a main fuel supply pipe and an auxiliary fuel supply pipe. The main fuel pipe has a portion in the form of a frustoconical spiral disposed in a vaporization chamber heated by the exhaust gases of the engine. A thermostat is responsive to the temperature in the vaporization chamber and controls the supply of fuel above a given temperature in said chamber. The auxiliary fuel supply pipe is surrounded at least partly by an electric heating resistance and an auxiliary air intake pipe communicates with said air intake pipe. Control means are provided for heating the resistance and allowing supply of auxiliary air and auxiliary fuel for starting the engine above a predetermined temperature in the heating resistance and so long as the given temperature of the vaporization chamber has not been reached.

3,789,818

FUEL INJECTION SYSTEMS

John Harrison Asbery, Wembley, and Ivor Fenne, Greenford, both of England, assignors to C. A. V. Limited, Birmingham, England

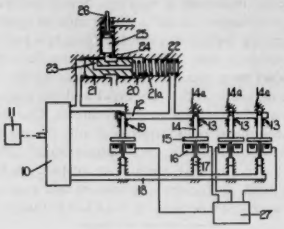
Filed Oct. 27, 1972, Ser. No. 301,587

Claims priority, application Great Britain, Oct. 30, 1971, 50526/71

Int. Cl. F02d *5/02*

U.S. Cl. 123—139 AM **5 Claims**

A fuel system for an internal combustion engine includes an accumulator for storing fuel under pressure a plurality of injection valves connected to the accumulator through a conduit a shuttle member for controlling the amount of fuel flow-



ing to the injection valves from the accumulator during an injection stroke and an additional valve operable to permit the return of the shuttle at the other end of the injection stroke.

3,789,819

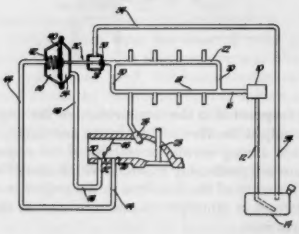
FUEL RAIL VAPOR BLEED

John W. Moulds, Penfield, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1972, Ser. No. 221,640

Int. Cl. F02m *5/06*

U.S. Cl. 123—140 MP **4 Claims**



In an internal combustion engine fuel injection system, a vacuum operated valve opens during closed throttle engine operation to permit fuel vapor to bleed from the end of the pressurized fuel rail back to the fuel tank.

3,789,820

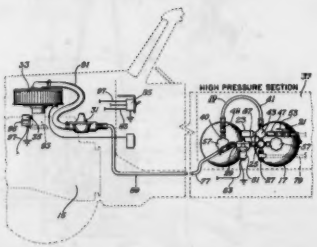
COMPRESSED GASEOUS FUEL SYSTEM

Lloyd A. Douglas, and Kirk T. Garanflo, both of Fort Worth, Tex., assignors to Victor Equipment Company, Denton, Tex.

Filed Oct. 19, 1971, Ser. No. 190,550

Int. Cl. F02m *13/06, 13/68*

U.S. Cl. 123—27 GE **12 Claims**



Apparatus for enabling a conventional vehicle to be operated on a compressed gaseous fuel, characterized by a

high degree of safety with features such as concentrating the high pressure portion of the apparatus into a section that is located outside of the passenger compartment for safety; employing a remote indicating fuel gauge that does not have a fuel connection inside the passenger compartment; employing double regulators with respective relief valves vented to a safe area; employing special factory-tested high pressure assemblies, and employing an excess flow shut-off valve for blocking flow in the event of a line failure. Also disclosed are specific embodiments such as employing a single stage compensated high pressure regulator for uniform performance until the container of compressed gaseous fuel is substantially empty; and parallel connected containers for increased range.

3,789,821

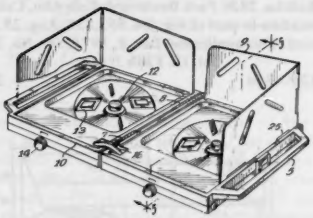
MODEL 2600 CAMPING STOVE DESIGN

Bernard E. Fick, Tulsa, Okla., and Kim Yamasaki, Lombard, Ill., assignors to Brunswick Corporation, Skokie, Ill.

Filed July 7, 1972, Ser. No. 269,772

Int. Cl. F24c *5/20*

U.S. Cl. 126—38 **5 Claims**



The invention is a portable camping stove having two burners. The burners are housed in separate casings, which casings are hinged together so that the burners fold face-to-face and the folded housing takes on the appearance of a briefcase. The top side of each casing is removable and comprises a drip pan for the burner. A pressure regulator is disposed within one of the burner casings and a flame control regulator is mounted on the front of each burner casing. A windscreen for each burner folds to a stored position over each casing.

3,789,822

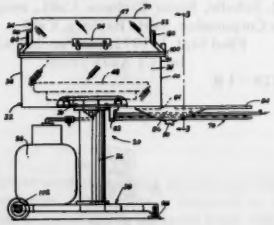
HINGED COVER DEEP FAT FRYER, GRIDDLE AND BARBEQUE

John S. Schantz, Marine, Ill., assignor to Raymond G. Schantz and Socrates J. Schantz, both of Marine, Ill., part interest to each

Filed Nov. 30, 1972, Ser. No. 310,774

Int. Cl. A47j *37/00*; **F24c** *3/04*

U.S. Cl. 126—41 R **14 Claims**



A portable gas stove supporting for separate use a deep fat fryer, griddle and barbeque with a uniquely designed cover which serves as a griddle when in a closed position, a deep fat fryer in a reversed or inverted position and a barbeque heat reflector and windshield when opened to a vertically extending position. The stove has an open top within which a gas burner is provided. The open top of the stove supports the cover in a closed position where the flat top surface of the cover acts as a griddle. Hinge means enable the cover to be opened to a vertical position acting as a heat reflector and windshield. When the cover is reversed its open box like structure enables it to receive grease to act as a deep fat fryer. Hinged means are provided enabling the cover to rest upon the open top housing of the stove and be quickly hinged to a vertically extending in open position for use as a barbeque and to further enable the cover to be removed and reversed to act as a deep fat fryer.

3,789,823

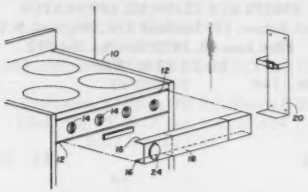
STOVE PROTECTOR

Patricia A. Doskocil, New York, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.; a part interest

Filed Apr. 23, 1973, Ser. No. 353,681

Int. Cl. F24c *3/12*

U.S. Cl. 126—42 **5 Claims**



A device for protecting a stove from accidental release of heat or gas due to faulty manipulation of controls by children, pets and the like. The controls extend out of a vertical surface of the stove. A horizontally elongated shield is adapted to detachably cover the controls. The shield has at least one port permitting access to a control. A disc is pivotally secured to the shield to normally cover said port. The disc is manually pivotable out of sealing engagement with the cover.

3,789,824

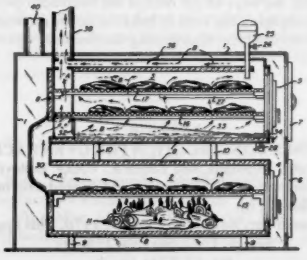
COOKING STRUCTURE

William B. Mason, Memphis, Tenn., assignor to Barbecue Ovens, Inc., Memphis, Tenn.

Filed Dec. 4, 1972, Ser. No. 312,192

Int. Cl. A01g *13/06*

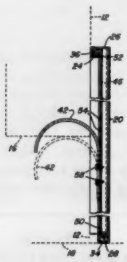
U.S. Cl. 126—59.5 **8 Claims**



A cooking structure comprising a pair of elongated insulated ovens spaced apart one above the other with individual

doors at their adjacent ends, and a common upright flue at their opposite ends, there being removable grills between top and bottom of each oven. The lower portion of the lower oven forms a firebox with an outlet for the products of combustion at one end which may discharge into the flue or into the lower part of the upper oven according to the setting of a manually-adjustable damper. The upper oven has a horizontal passageway extending above the oven grill for the full length of the oven with a connection to the flue. Means are provided for supplying water or sauce to a grill in the upper oven and for discharging the same from the lower portion thereof. Preferably both ovens are enclosed in a sheet metal casing with inlets for an air supply to the firebox in the lower oven. The cooker eliminates continuous personal attention to broiling or barbecuing operations, moistens smoke from the logs or charcoal in the firebox which flows around meat on the grills breaking down tough fibers and permitting the natural juices to saturate the inner portions and outer surfaces evenly flavoring and cooking the meat without basting or turning the meat which is thoroughly tenderized and given an attractive color.

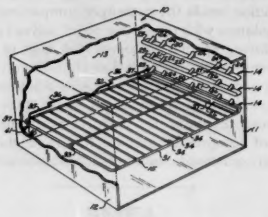
3,789,825
FIREPLACE CLOSURE APPARATUS
Lawrence O. Reiner, 109 Eastland Ave., Brighton, N.Y.
Filed June 20, 1972, Ser. No. 264,552
Int. Cl. F24c *15/28*
U.S. Cl. 126—140 **5 Claims**



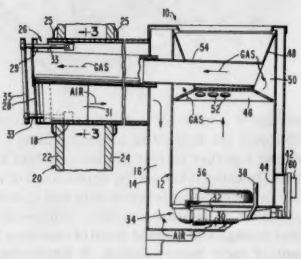
A closure device for sealing a fireplace opening over the hearth of the fireplace when it is not in use, having a cover member with sealing material along the bottom edge and along the back of the cover member along the side and top edges, and also having a pair of "J" shaped springs mounted on the back of the panel by a height adjusting mechanism for covering over the edge of the roof of the fireplace opening and frictionally engaging the roof to hold the cover member firmly but detachably in place, thus sealing the fireplace opening.

3,789,826
RUNNER CONSTRUCTION FOR OVEN RACK
Albert L. Baltz, Millstadt, and Elmer E. Voeke, Belleville, both of Ill., assignors to Eagle Range and Manufacturing Company, Belleville, Ill.
Continuation of Ser. No. 95,730, Dec. 7, 1970. This application June 5, 1972, Ser. No. 259,401
Int. Cl. F24c *15/16*
U.S. Cl. 126—339 **1 Claim**

This rack and runner construction includes opposed runners attached to the sidewall of an oven compartment and having inclined bearing glides spaced along their length, each pair of horizontal runners receiving a rack in sliding engagement. Each rack includes rear guide elements cooperating with associated horizontal runners to limit upward and outward movement of the rack.



3,789,827
ROCK HEATER FOR SAUNA BATH
Toivo I. Kolkka, 2030 Park Boulevard, Palo Alto, Calif.
Continuation-in-part of Ser. No. 852,838, Aug. 25, 1969, abandoned. This application Dec. 8, 1971, Ser. No. 205,824
Int. Cl. F24h *3/14*
U.S. Cl. 126—344 **20 Claims**



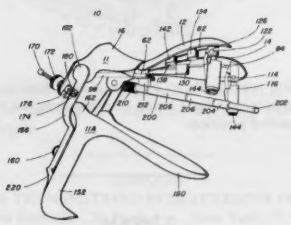
An improved rock heater wherein an imperforate rock box extends into and closes the top of a generally continuous side wall enclosing a combustion region. Air for supporting combustion in the region is preheated as it flows toward the same along a passage between the wall and a casing surrounding the wall. Exhaust gases are directed along an inclined path from an area surrounding the outer surface of the rock box and into the atmosphere. In one form, the rock heater has the exhaust path extending through the rock box and in another form, the rock box has a conical outer surface.

3,789,828
URETHRAL PROSTHESIS
Rudolf R. Schulte, Santa Barbara, Calif., assignor to Heyer-Schulte Corporation, Santa Barbara, Calif.
Filed Sept. 1, 1972, Ser. No. 285,637
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 R **17 Claims**

A prosthesis to resist the flow of urine through the urethra, which comprises a fluid-impervious, flexible and deformable

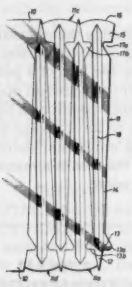
capsule having a gel-filled, or gel and liquid-filled cavity therein. A cover encapsulates the capsule, and two flexible sling ties extend beyond the cover. The material of the cover and of the ties is such as to enhance fiber ingrowth into openings formed by the material, whereby mechanically to stabilize the prosthesis when it is implanted in the human body.

3,789,829
VAGINAL RADIUM APPLICATOR
Harrith M. Hasson, 6942 N. Waukesha Ave., Chicago, Ill.
Filed June 1, 1971, Ser. No. 148,823
Int. Cl. A61n *5/10*
U.S. Cl. 128—1.2 **8 Claims**



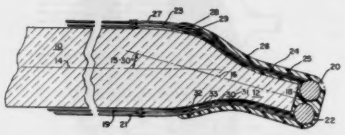
A radium applicator for treating cancer of the uterus formed in the shape of a vaginal speculum. The speculum applicator comprises an upper colpostat housing having a pair of pivotable arms connected thereto and a lower retractor blade assembly. A radium-carrying ovoid is connected to each colpostat arm and a linkage is connected to each ovoid for pivoting each ovoid about an axis that is substantially perpendicular to the pivotal axis of its colpostat arm. Means are provided for connecting a radium-carrying tandem to the colpostat's saddle handle after the applicator has been inserted in the vagina.

3,789,830
DISPOSABLE LANCET
Sven-Erik Malmstrom, Reftele, Sweden, assignor to Swedish Hospital Supply SHS AB, Malndal, Sweden
Filed Sept. 22, 1971, Ser. No. 182,862
Int. Cl. A61b *10/00, 17/32*
U.S. Cl. 128—2 F **4 Claims**



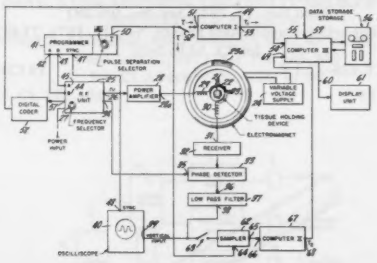
A disposable lancet used for piercing the tissue of a finger to obtain blood specimens. The lancet is designed to contain minimum material to achieve low material costs which still have the strength and rigidity to be completely functional. The lancet design permits multiple lancets to be punched from a strip of sheet steel to obtain economy in the manufacturing operation.

3,789,831
THERMOELECTRIC PROBE APPARATUS FOR TISSUE FLUID FLOW MEASUREMENT
Dennis R. Kopaniky, Case Western Reserve University, School of Medicine, 2109 Adelbert Rd., Cleveland, Ohio, and Donald S. Gann, 720 Rutland Ave., Baltimore, Md.
Filed Feb. 11, 1972, Ser. No. 225,582
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 F **3 Claims**



This is a thermoelectric probe apparatus which is responsively connected to an electrical amplifying readout circuit. The probe is most useful in sensing blood flow at minute loci throughout the animal body. It can sense as low as zero blood flow with significantly less tissue trauma than previous devices.

3,789,832
APPARATUS AND METHOD FOR DETECTING CANCER IN TISSUE
Raymond V. Damadian, 64 Short Hill Rd., Forest Hill, N.Y.
Filed Mar. 17, 1972, Ser. No. 235,624
Int. Cl. A61b *5/05*
U.S. Cl. 128—2 R **16 Claims**

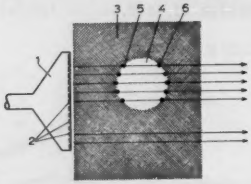


An apparatus and method in which a tissue sample is positioned in a nuclear induction apparatus whereby selected nuclei are energized from their equilibrium states to higher energy states through nuclear magnetic resonance. By measuring the spin-lattice relaxation time and the spin-spin relaxation time as the energized nuclei return to their equilibrium states, and then comparing these relaxation times with their respective values for known normal and malignant tissue, an indication of the presence and degree of malignancy of cancerous tissue can be obtained.

3,789,833
HEART EXAMINATION BY MEANS OF ULTRASOUND WAVES
Nicolaas Bom, Berkenwoude, Netherlands, assignor to Medische Faculteit Rotterdam, Rotterdam, Netherlands
Filed Mar. 23, 1972, Ser. No. 237,286
Claims priority, application Netherlands, Mar. 31, 1971, 7104271
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 V **5 Claims**

An examination of the human heart is carried out by means of ultrasound waves emitted by piezo-electric crystals. The

crystals are inserted in a holder adapted to be placed on the body of a patient; they are arranged in a row and have parallel axes of radiation. The crystals are cyclically excited at a high scanning frequency, and the echo signals reflected by the heart walls and received by the crystals are displayed on the screen of a cathode ray tube to obtain a cross-sectional picture of the heart. In a modification of the invention, the holder comprises two or more rows of crystals radiating at different angles; in this case the echo signals related to a common point of the heart wall are superposed on the screen of the cathode ray tube by means of a coordinate transformation.

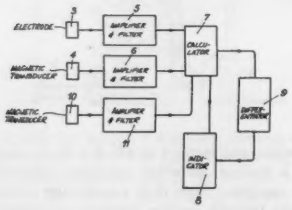


3,789,834

PROCESSES AND APPARATUS FOR THE INVESTIGATION OF INTERNAL PHYSIOLOGICAL PHENOMENA BASED ON MEASUREMENTS OF THE IMPEDANCE VARIATION OF THE SURFACE OF THE BODY

Jean Duroux, 12, rue Flatters, Paris, France

Filed Nov. 14, 1972, Ser. No. 306,481
Claims priority, application France, Nov. 15, 1971, 7140737
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.1 Z **14 Claims**



A method of investigating physiological phenomena of a portion of a body based upon the variation of the impedance or resistivity of the body. An electromagnetic field is applied to a portion of the body and the field at the surface of the body is then measured. The components of the measured field are used to determine the impedance or resistivity of the the body.

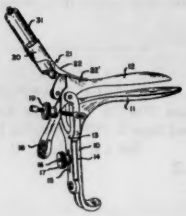
3,789,835

ILLUMINATING ATTACHMENTS FOR VAGINAL SPECULUM

Robert S. Whitman, 6407 Beacon St., Pittsburgh, Pa.

Filed Mar. 16, 1972, Ser. No. 235,333
Int. Cl. A61b *1/30, 1/06*
U.S. Cl. 128—18 **7 Claims**

A modified Graves Vaginal Speculum is provided having cooperating upper and lower blades pivoted with respect to one another, the upper blade having a longitudinal slot in the upper blade at the rear portion thereof, a removable light carrier member frictionally engaging the upper blade at the slot and curving rearwardly to engage a light source, said source and arm directing a light beam intermediate the two blades in their expanded position.

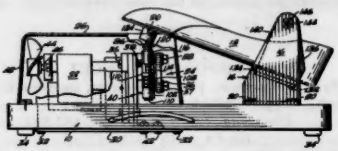


3,789,836

APPARATUS FOR THE STIMULATION OF BLOOD CIRCULATION IN FEET AND LEGS

William Girten, Fort Lauderdale, Fla., assignor to Joseph W. Scott and Zephyr Scott, both of Miami, Fla.

Filed Dec. 7, 1972, Ser. No. 311,740
Int. Cl. B61h *1/02*
U.S. Cl. 128—25 B **13 Claims**



A device for stimulating the circulation of blood in the feet and legs of a standing or seated person, which comprises a pair of treadles to receive the feet of a person when the calves of the legs are in substantially upright positions, such as in a normal standing or sitting position. The treadles are pivotally mounted and linked to drive means to impart a generally up and down oscillating movement thereto, whereby the movement is imparted to the feet in a manner so as to oscillate the feet about the ankle joints.

3,789,837

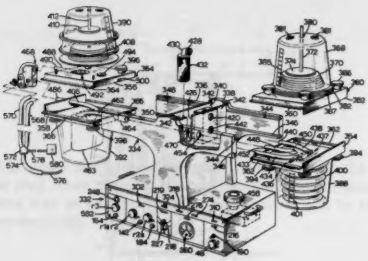
AUTOMATIC THERAPEUTIC VENTILATOR

Walter John Philips, 250 Canandra Blvd., Apt. 140, Don Mills, Ontario, and Jack Anthony Liddall, 43 Mineola Rd. East, Port Credit, Ontario, both of Canada

Filed Dec. 11, 1970, Ser. No. 97,279
Int. Cl. A61m *16/00*
U.S. Cl. 128—145.8 **37 Claims**

An automatic therapeutic ventilator having an oxygen bellows for receiving and measuring a volume of oxygen and a breathing mixture bellows for mixing the oxygen with air in a

predetermined ratio. Pneumatic and electrical control circuits are provided for automatic, semi-automatic, and patient-triggered modes, and a sigh circuit is incorporated in the control circuits. The bellows are mounted on trays which can be replaced simply.



3,789,838

FORCE TRANSMITTING INTRAUTERINE DEVICE

Erick-Pierre Fournier, 30 Park Ave., New York, N.Y., and Alberto Lomeo, 200 E. End Ave., New York, N.Y.

Filed Feb. 19, 1971, Ser. No. 116,867

Int. Cl. A61f *5/46*

U.S. Cl. 128—130 **16 Claims**

An intrauterine contraceptive device having substantial surface area for contact with the endometrium and capable of being releasably contracted to a size and shape for ready passage into the uterus and, when released, of expanding to conformably engage the walls of the uterine cavity in the mid-uterine area above the level of the internal so to resist expulsion, and thereafter of being readily removed, together with an introducer implement for releasably contracting the device in the proper orientation for insertion are disclosed.

3,789,839

COVERING FOR PROTECTING HEAD AND FACE FROM DANGEROUS AEROSOLS AND GASES

Bodil Vibeke Jerslev Lund, and Frederik Christian Freuchen Oxenboll Lund, both of Hellerup, Denmark, assignors to Civilforsvarsstyrelsen, Copenhagen, Denmark

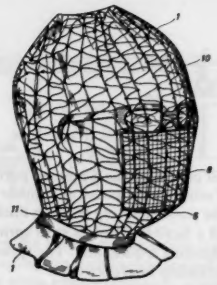
Filed June 27, 1972, Ser. No. 266,573

Claims priority, application Denmark, June 29, 1971, 3212/71

Int. Cl. A62b *18/04;* **A42b** *1/18*

U.S. Cl. 128—142.7 **5 Claims**

A protective hood adapted to surround the head of a person in order to protect him against contact with and inhalation of aerosols and gases and other dangerous substances, the hood consisting of a bag-shaped member made of plastic foil, preferably transparent plastic foil, in which an opening is provided and closed by an inhalation filter, a shrouding member being provided and adapted to surround the hood and press it into contact with the surface of the head of the user, so that the dead space in the hood is decreased, said shrouding member preferably consisting of a hood-shaped, elastic net.



3,789,840

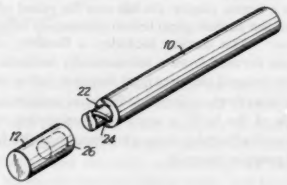
DEVICE FOR ASSISTING CIGARETTE SMOKERS TO DISCONTINUE SMOKING

Richard D. Rosenblatt, 4941 Arlington Ave., Riverdale, N.Y.

Filed July 27, 1971, Ser. No. 166,345

Int. Cl. A61m *31/00;* **A24f** *47/00*

U.S. Cl. 128—260 **11 Claims**



A device for assisting smokers to give up smoking cigarettes and which provides a chemical substance to suppress the desire for smoking and also satisfies the psychological requirements associated with giving up smoking. The device in its assembled form resembles a cork tipped cigarette. The white portion is a plastic barrel. The cork portion is a lozenge preferably containing a chemical substance which inhibits the desire for tobacco. The two portions are preferably packed separately and the smoker in attaching them, satisfies the requirement of "lighting up." The device is used as a normal cigarette and sucking on the lozenge and removing it from the mouth satisfies the oral gratification associated with smoking. The device may also be provided with a simulated ash which may also be luminous under the control of the smoker. This latter feature satisfies further psychological requirements associated with smoking.

3,789,841

DISPOSABLE GUIDE WIRE

William T. Antoshkiw, Kearny, N.J., assignor to Becton, Dickinson & Company, East Rutherford, N.J.

Filed Sept. 15, 1971, Ser. No. 180,810
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 10 Claims

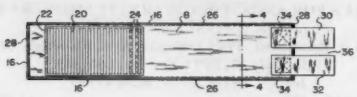
A stainless steel core wire has a tapered portion at one end and a portion of uniform thickness at another end. A Teflon jacket encloses the portion having uniform thickness to form a proximal end and a flexible stainless steel spring encloses the tapered portion forming a distal end. The spring is secured at both ends to the stainless steel core wire.

3,789,842

THERAPEUTIC SUPPORT DEVICE

Avrum I. Froimson, 19300 Shelburne, Shaker Heights, Ohio

Filed Oct. 21, 1971, Ser. No. 191,389
Int. Cl. A61f 13/00
U.S. Cl. 128—165 3 Claims



A theropeutic support device of the type to be worn by a user, such as a tennis player, on his arm for relief of the pain resulting from the pathological lesion commonly referred to as "tennis elbow." The device includes a flexible, elongated band-like body formed from a substantially inelastic material for disposition around the proximal forearm below the elbow, and having a selectively adjustable fastener system to hold the opposed ends of the body in secured overlapping relation to provide a closed adjustable loop encompassing the forearm in the installed position thereof.

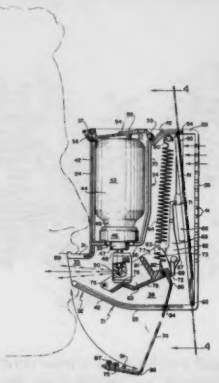
3,789,843

BREATH-ACTUATED AEROSOL DISPENSER

John C. Armstrong, Milton, and George F. Lyman, Weston, both of Mass., assignors to Armstrong-Kropp Development Corporation, West Roxbury, Mass.

Filed Feb. 23, 1972, Ser. No. 228,529
Claims priority, application Great Britain, Feb. 25, 1971, 5,450/71
Int. Cl. A61m 11/00
U.S. Cl. 128—173 5 Claims

An inhalation device for use with an aerosol container capable of discharging a metered amount of an aerosol formulation on depression of its valve nozzle comprising, a chamber, a mouthpiece communicating with the chamber, a mechanism for causing actuation of the valve including a movable wall, a linking lever, an actuating lever, a spring biasing the actuating lever, and a latch mechanism such that the movable wall member disposed between an air admission port into said chamber and said moutnpiece moves away from said port under influence of air flow through said port to release the latch mechanism when suction is applied to said mouthpiece and therefore causing the actuating lever to actuate the valve.

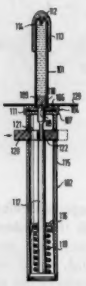


3,789,844

FOIL SEALED SYRINGE

Albert Burges, Georg-Kalb-Strasse 5, 8021 Grosshesselohe, Germany

Filed Sept. 10, 1971, Ser. No. 179,427
Claims priority, application Germany, Apr. 16, 1971, 2118631
Int. Cl. A61m 1/00
U.S. Cl. 128—235 4 Claims



A spring loaded syringe device is provided with a liquid container which is foil sealed. The foil is pierced by an actuating rod of the device which also engages the piston of the syringe when the syringe is operated, for example as an enema device.

3,789,845

CAPSULE AND TABLET ADMINISTRATION FOR ANIMALS

J. Raymond Long, R.D. No. 3, Cuba, N.Y.

Filed Jan. 29, 1973, Ser. No. 327,425
Int. Cl. A61f 5/46; A61m 31/00
U.S. Cl. 128—264 17 Claims

A syringe holder tube is used to administer capsules or tablets to animals. A capsule is pressed into the opening at the rounded end of the tube and turned to seat in the opening with most of the capsule extending outward from the tube. Then the animal's mouth is opened and the tube is quickly thrust over base of tongue and into the throat where the capsule or

tablet is dislodged when contacting the soft palate and is automatically swallowed by the animal. For tablets, a syringe piston is removably inserted in the tube opening to serve as a

plug, and a sticky food material is used to stick the tablet to the plug. Then the tube is thrust into the animal's mouth in the same way to knock the tablet off where it will be swallowed automatically.

3,789,846

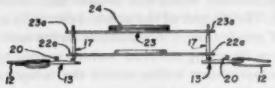
FASTENING APPARATUS FOR OSTOMY APPLIANCES

Donald Dean Barrett, Palos Hills, Ill.; Kenneth R. Whalen, Worth, Ill.; Charles Nichols, Arlington Heights, Ill.; Robert G. Knapp, Wheaton, Ill.; Jay A. Wickum, Westmont, Ill., and Daniel A. Maust, Winfield, Ill., assignors to Marsan Manufacturing Co., Inc., Chicago, Ill.

Continuation of Ser. No. 105,286, Jan. 11, 1971, abandoned. This application Nov. 20, 1972, Ser. No. 307,936

Int. Cl. A61f *5/44*

U.S. Cl. 128—283 **11 Claims**



A fastening apparatus for securing ostomy appliances which apparatus includes a belt and fastening elements provided with structure for releasably securing, at an ostomy site, a rigid base gasket and an expendable retainer gasket and attached pouch, to retain the base gasket in place during removal and replacement of the expendable retainer gasket and pouch.

3,789,847

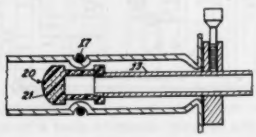
TOOL FOR LOWER COLON SURGERY

Arnold L. Lehmann, W. 49-34th Ave., Spokane, Wash.

Filed Aug. 19, 1971, Ser. No. 173,012

Int. Cl. A61b *17/02, 17/11;* **A61m** *3/00*

U.S. Cl. 128—303 R **4 Claims**



A combination of an obturator designed to be apposed to the bowel and an external perineal tractor for assisting a surgeon during lower colon surgery. By fixing the relative axial positions of the obturator and tractor on a supporting pipe or rod, maximum "stretch" of the bowel is achieved and upward pressure can be applied on the perineum to assure the surgeon of an adequate length of bowel for anastomosis.

3,789,848

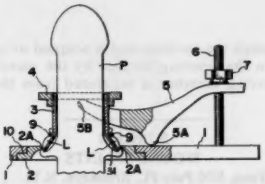
CIRCUMCISION INSTRUMENT

Michitaro Honjyo, 279 Ogimachi, Imadegawa Teramachi Kamigyoku, Kyoto, Japan

Filed Mar. 19, 1973, Ser. No. 342,848

Int. Cl. A61b *17/32, 17/00*

U.S. Cl. 128—305 **1 Claim**



Different from the known circumcision method, this invention resides in pulling out surplus skin around the base of penis so as to expose glans penis completely, crushing and cutting off said surplus skin without bleeding while leaving prepuce unharmed.

The circumcision instrument for carrying out said method is simple and easily maneuverable. The main action of said instrument is to bring surplus skin pulled over tapered skirt between said skirt and cooperating circular blunt edge and crush said surplus skin by lifting said skirt.

3,789,849

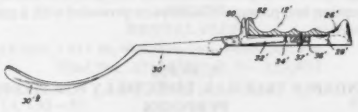
OBSTETRICAL FORCEPS

Leonard E. Laufe, 1206 Iverness Ave., Pittsburgh, and Victor Jackman, Westmoreland, both of Pa., assignors to by said Jackman said Laufe

Filed Apr. 26, 1971, Ser. No. 137,169

Int. Cl. A61b *17/44*

U.S. Cl. 128—323 **22 Claims**



Obstetrical forceps for assisting in the delivery of a baby. The forceps include a pair of elongated members pivotably connected with each other. Each member includes a fetus-engaging blade portion and a handle portion. At least one of the members has means movably connecting the blade portion thereof to its handle portion. Such blade and handle portions are connected in such a manner that the blade is shiftable a limited amount with respect to the handle. Biasing means are provided for holding the shiftable blade in an axially aligned position with respect to the handle. The biasing means are constructed and arranged to impart a predetermined holding force on the blade for holding the respective shiftable blade and handle together whereby when a force above and generally opposite in direction to the holding force is applied to the shiftable blade, as during the use of the forceps to assist delivery of a baby, the shiftable blade portion will shift its position relative to the handle.

3,789,850

IMPLEMENT FOR PIERCING EAR-LOBES

James W. Ford, 1018 Elmwood, Wilmette, Ill.

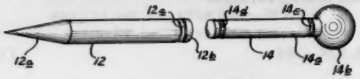
Filed Feb. 2, 1972, Ser. No. 222,920

Int. Cl. A61b *17/34;* **A44c** *7/00*

U.S. Cl. 128—329 **2 Claims**

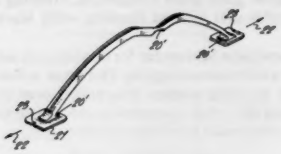
An implement or device for piercing ear-lobes and forming an opening therethrough for receiving ear rings which com-

prises a pointed, hollow, sheath-like ear-lobe piercing member and a separable, ear-lobe opening stabilizing member. The stabilizing member is carried by the piercing member as the latter



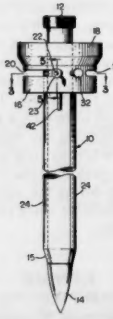
is passed through the ear-lobe and is adapted to be temporarily retained in the opening formed by the piercing member after the piercing member is separated from the stabilizing member.

3,789,851
WOUND SPLINTS
Harry H. LeVeen, 800 Poly Pl., Brooklyn, N.Y.
Continuation-in-part of Ser. No. 813,478, April 4, 1969, abandoned. This application July 1, 1971, Ser. No. 158,687
Int. Cl. A61b *17/04*
U.S. Cl. 128—335 **3 Claims**



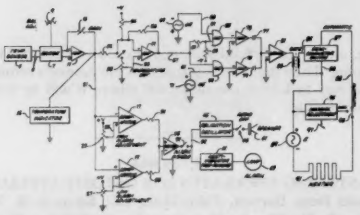
Semi-rigid resilient bars or bar-like materials of slightly pliable elastomeric plastics are provided for use in post-surgical procedures in connection with sutures for closing incisions. The bars may be of various cross-sectional configurations, such as a flat or semi-circular bar, with a downwardly converging slot or groove for the reception, guiding and gripping of the sutures. Alternatively, the bar-like element may be bowed or bridge-like with expanded terminal foot portions slotted for the reception and passage of sutures or provided with a central hinge portion.

3,789,852
EXPANDABLE TROCHAR, ESPECIALLY FOR MEDICAL PURPOSES
Sung Soo Kim, 4724 Imperial Park Dr., Fort Wayne, Ind., and Andress Dusseau, R.R. No. 1, Geneva, Ind.
Filed June 12, 1972, Ser. No. 261,794
Int. Cl. A61b *17/34*
U.S. Cl. 128—347 **17 Claims**



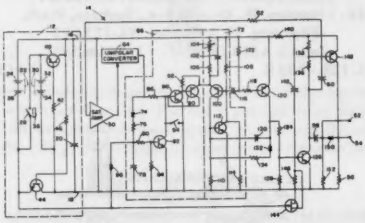
An expandable tubular element, especially for use as a trochar, in which one or more thin metal strips, such as stainless steel, are arranged to form a tubular element with the tubular element being radially expandable and contractible.

3,789,853
RADIANT ENERGY HEATING SYSTEM FOR TEMPERATURE CONTROL OF LIVING SUBJECTS
Clyde Reinhard, 220½ Reposado, La Habra Heights, Calif.
Filed May 22, 1972, Ser. No. 255,684
Int. Cl. A61f *7/00*
U.S. Cl. 128—399 **10 Claims**



A temperature sensor attached to a living subject and is connected to a control circuit having an input for connection to a source of alternating current power and an output from which half-waves of the alternating current power are generated when the temperature of the sensor falls below a first temperature and full-waves of the alternating current power are generated when the sensor falls below a second temperature. The output of the control circuit is connected to a plurality of pre-focussed incadescent lamps with infrared filters, the lamps directing infrared radiant energy to a region of controlled temperature within which the temperature sensor and living subject are located.

3,789,854
DUAL MODE CARDIAC PACER POWER SOURCE
Jin W. Lee, North Miami, Fla., assignor to Medcor, Inc., Hollywood, Fla.
Filed Apr. 6, 1972, Ser. No. 241,577
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **15 Claims**



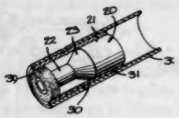
A power source for a cardiac pacer operative in first and second states to provide respectively redundant battery power to said pacer and series connected battery power to said pacer. The alternative power source states permit accurate evaluation of battery conditions and provide altered cardiac pacer operating characteristics adapted to enable emergency operation for the relief of predetermined cardiac patient conditions.

3,789,855

HIGH FLAVOR IMPACT, LOW SMOKE YIELD CIGARETTE MOUTHPIECE

Dr. Vello Norman, Durham, N.C., assignor to Liggett & Myers Incorporated, New York, N.Y.

Filed June 22, 1971, Ser. No. 155,517
Int. Cl. A24d *1/04*; A24f *5/04*
U.S. Cl. 131—9 7 Claims



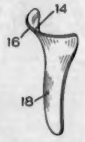
A cigarette mouthpiece for an unfiltered cigarette in which the proportionate volume of smoke drawn from the tobacco section of the cigarette into the smoker's mouth is regulated with respect to the volume of ventilating air simultaneously drawn into the smoker's mouth where the smoke and the air are first commingled, the regulation providing precise, preselected control over the dilution of the smoke in the smoker's mouth. The mouthpiece comprises at least one central smoke passage and ventilation perforations around the periphery of the mouthpiece. A particular draw resistance for the smoke passage is selected to complement a particular draw resistance for the ventilation perforations, thereby regulating the respective volumes of smoke and air entering the smoker's mouth when he draws on the cigarette.

3,789,856

SHIELD FOR USE IN APPLYING EYELASH MAKEUP

Zdenka Bomba, R.R. 1 McCowan Rd., Agincourt, Ontario, Canada

Filed Aug. 5, 1971, Ser. No. 169,289
Claims priority, application Canada, June 9, 1971, 115175
Int. Cl. A45d *40/30*
U.S. Cl. 132—88.5 4 Claims



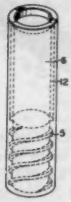
The present invention provides a device which may be used during the application or removal of eyelash makeup. The device consists of a body of plastic material which is formed with a lip at its upper end which projects a substantial distance outwardly from the remainder of the body. The lip has an arcuate curvature conforming generally to the curvature of the human eye and is disposed in a plane which is substantially at right angles to the plane of the remainder of the body. The outer edge of the lip extends in a plane which is substantially parallel with the remainder. The upper end of the body which extends between the lip and the remainder of the body is formed with a curvature so as to fit around the underside of the eyeball of the user.

3,789,857

STICK TYPE COSMETIC APPLICATOR

Shinichi Ikeda, Kawaguchi, and Toshio Taguchi, Tokyo, both of Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1973, Ser. No. 333,930
Int. Cl. A45d *40/26*
U.S. Cl. 132—88.7 5 Claims



A stick type cosmetic applicator provided with a cylindrical casing, a base member rotatably disposed at the lower end of the casing and an actuating means disposed therein for projecting and retracting a solid cosmetic contained therein. The actuating means comprises a relay barrel and a saucer supporting the cosmetic which are movably engaged with each other and which are turnably and slidably engaged with the cylindrical casing and the base member, respectively, by means of the key and the screw mechanisms provided in the applicator. The relay barrel is elevated and lowered relative to the cylindrical casing when the base member is rotated with respect to the cylindrical casing, simultaneously the saucer is relatively elevated and lowered to the relay barrel, whereby the solid cosmetic is smoothly and quickly projected and retracted therewith in respect to the applicator.

3,789,858

DENTAL FLOSS

Louis Pesce, 1311 W. Webster Ave., Maitland, Fla.

Filed Dec. 27, 1971, Ser. No. 212,472
Int. Cl. A61c *15/00*
U.S. Cl. 132—89 5 Claims

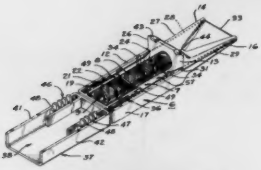
Dental floss comprises a pair of strands twisted together. One strand is smooth and relatively strong, for example nylon. The other strand is relatively weak and has tufts at spaced intervals thereon for cleaning between the teeth and may be example cotton.

3,789,859

DENTAL FLOSS HOLDER

Ondas S. Chambers, 1425 Walnut St., Alameda, Calif.

Filed Aug. 21, 1972, Ser. No. 282,125
Int. Cl. A61c *15/00*
U.S. Cl. 132—92 R 3 Claims



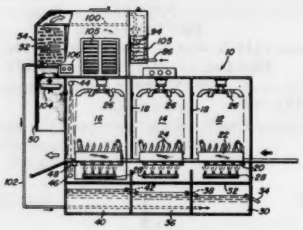
An improved Dental Floss Holder for removing food particles lodged between the teeth of a person. It is of the type which retains a section or length of dental floss in taut position between a pair of spaced prongs for application between the person's teeth, and in which a fresh portion of the floss may be easily and quickly advanced into operative position between the prongs.

3,789,860

METHOD AND APPARATUS FOR TREATING DISHWASHER DISCHARGE

Fred H. Katterheinrich, and Gerald B. Fox, both of Troy, Ohio, assignors to The Hobart Manufacturing Company, Troy, Ohio

Filed Nov. 5, 1971, Ser. No. 196,091
Int. Cl. B08b *15/00*
U.S. Cl. 134—104 24 Claims



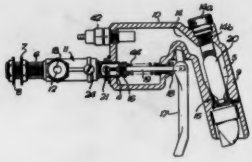
In a dishwasher of the type in which racks of dishes are carried through a series of washing and rinsing stations, the hot, moisture laden air emitted by the dishwasher is directed over a series of cooling coils to both cool the air and remove by condensation a substantial portion of the moisture. The cooled, dried air is then exhausted to ambience. Relatively cool tap water is utilized in the cooling coils with the water passing from the coils to the first stage of the dishwasher for use in washing dishes. A valve regulates water flow to the cooling coils and is controlled by the same switch which actuates the final rinse stage of the dishwasher so that additional cooling capacity is gained during the final rinse stage. An adjustable opening is also provided for admitting ambient air into the apparatus for mixture with the air from the cooling section to prevent a build-up of condensate in the sections of the apparatus downstream of the cooling section.

3,789,861

DEVICE FOR CLEARING BLOCKED PIPES

Jack Samuel Conn, Walton-on-Thames, and Lionel Ralph Fabien, London, both of England, assignors to Surrey Steel Components Limited, Surrey, England

Filed May 8, 1972, Ser. No. 251,397
Claims priority, application Great Britain, May 10, 1971, 14,020/71
Int. Cl. B08b *9/02*; B67b *7/24*
U.S. Cl. 134—166 C 6 Claims



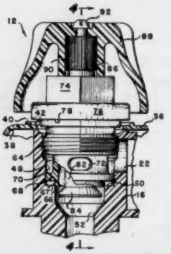
A device for use in clearing blocked pipes, drains and other conduits comprises a hollow body portion, means to receive a bottle or cartridge of compressed gas which means are operable to feed a controlled quantity of gas from the bottle or cartridge into the hollow body portion, a valve controlled outlet from the hollow body portion to an outlet conduit, and a liquid inlet to said outlet conduit with a non-return valve therein, the outlet being connectable to a blocked conduit so that liquid may be passed into the said outlet conduit and the blocked conduit through the said liquid inlet to fill the blocked conduit as far as the blockage and gas fed into the hollow body and held under pressure therein may be rapidly released therefrom by actuation of the valve and applied against the liquid in the conduits to impart a shock to the liquid.

3,789,862

DISPOSABLE VALVE CONSTRUCTION AND METHOD OF MAKING SEALS

Robert J. Keller, III., Richmond, Va., assignor to Kel-Win Manufacturing Company, Inc., Chester, Va.

Division of Ser. No. 197,741, Nov. 11, 1971. This application Nov. 6, 1972, Ser. No. 303,712
Int. Cl. F16k *1/04*
U.S. Cl. 137—15 4 Claims



A method of making seals in which the valve member is made from a flexible material, such as plastic. A valve housing member is provided with a longitudinal bore which communicates with a fluid to be dispensed. The housing member is provided with a countersunk portion to receive therein a hollow valve member. The latter is provided with a lower cylindrical portion, the bottom surface of which functions as a valve seat for a centrally disposed stem member. The outer surface of the lower cylindrical portion provides an interference fit for the bore of the housing member. The hollow valve body member is threaded into the countersunk housing until an interference seal is initially established with the bore

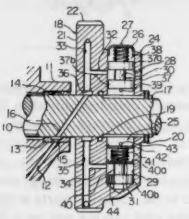
of the housing member. The valve body member is threaded further causing flexing of the valve body to occur as an integral annular skirt portion of the valve body engages the shoulder at the bottom of the countersunk which serves as a valve seat therefor. Continued threading of the valve body establishes a controlled tension on the valve housing member by an interference in length between the valve member and the housing member between the valve seat and a bottoming out position. While the countersunk portion is threaded to receive the valve body member, the bottom of the countersink is unthreaded and is positioned to support the annular skirt portion of the valve body and prevents radial movement thereof which would cause leaking under heavy pressures.

3,789,863

FLUID PRESSURE GOVERNOR VALVE

Koji Enomoto; Kunio Ohtsuka, and Wataru Ishimaru, all of Yokohama City, Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Dec. 7, 1971, Ser. No. 205,520
Claims priority, application Japan, July 14, 1971, 46/61181
Int. Cl. G05d *13/10*
U.S. Cl. 137—54 **1 Claim**



A fluid pressure governor valve adapted to produce a pressure signal that is proportional in magnitude to the speed of rotation of an output shaft of an automotive power transmission having a parking lock gear mounted for rotation with the output shaft, which governor valve consists of a valve body formed by a convex portion of the parking lock gear, first and second valve chambers formed in the convex portion of the parking lock gear, first and second passages formed in a disc portion of the parking lock gear and respectively communicating with the first and second valve chambers, and first and second drain ports formed in the convex portion of the parking lock gear and respectively communicating with the first and second valve chambers. The governor valve further consists of a primary governor valve element and a secondary governor valve element, which are radially movably accommodated in the first and second valve chambers, respectively. The primary and secondary governor valve elements are associated with each other for thereby producing a pressure signal that is proportional in magnitude to the speed of rotation of the output shaft.

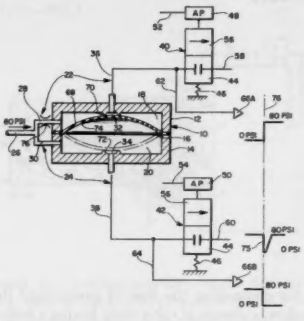
3,789,864

FLUID OPERATED SYSTEM

Larry C. Cowan, Saunderstown, and Edward A. Rubel, East Greenwich, both of R.I., assignors to Leesona Corporation, Cranston, R.I.

Continuation-in-part of Ser. No. 179,844, Sept. 13, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,635
Int. Cl. F15c *3/04*
U.S. Cl. 137—119 **12 Claims**

A fluid pulse operated system provides selective output for operating a fluid device, such as reversing operation of a fluid motor, or memory device in a logic environment. The system includes a pair of chambers separated by a flexible diaphragm. Fluid paths, one through each of the chambers, each includes an inlet for pressurized fluid into the associated chamber and a chamber outlet connected with a normally closed vent valve. Output signal lines are provided in the paths, one between each of the outlets and the associated vent valve, for connection with the motor or providing memory signals. The diaphragm serves as a valve member which selectively cooperates with one of a pair of valve seats, one for each of the outlets, for closing the selected outlet. During normal operation of the system either of the outlets may be open and the other closed by the diaphragm which is releasably retained in its selected closed position by a differential in facial area of



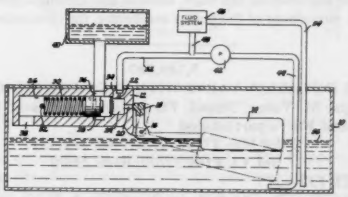
opposite sides of the diaphragm exposed to fluid in the respective chambers. In order to reverse the diaphragm, thereby opening the previously closed outlet and closing the formerly open outlet, the vent associated with the outlet to be closed is momentarily opened, thereby reducing the fluid pressure in the associated chamber and causing the diaphram to reverse its position and seat against the valve seat about the outlet to be closed. The system operates with little power while pulsing through a control cycle and stands by with no power in a static condition, by provision of positive fluid pressure, being decreased by control pulses and by provision of gating structures sealing off leakage paths in static condition.

3,789,865

LIQUID LEVEL CONTROL

August H. Borman, Farmington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 8, 1972, Ser. No. 287,507
Int. Cl. G05d *9/04*
U.S. Cl. 137—122 **3 Claims**



A liquid level control for maintaining a predetermined liquid level in a primary reservoir and permitting storage of excess fluid in a secondary reservoir. The fluid in the primary reservoir is delivered by a pump to a fluid operated system. Excess fluid which cannot be immediately utilized by the fluid system is returned via a valve to the primary reservoir. The primary reservoir has a level indicating device which operates the valve to control fluid return to the primary reservoir from the fluid system. When the fluid level in the primary system is

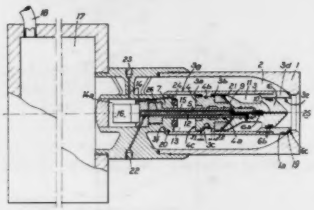
above a predetermined level the valve is operated to discontinue flow to the primary reservoir and direct the fluid to be stored temporarily in the secondary reservoir.

3,789,866

PRESSURIZED FLUID VALVES

Robert P. Combes, La Valette, France, assignor to Societe Pour Le Developpement De La Recherche Appliquee, Toulon, France

Filed Oct. 27, 1972, Ser. No. 301,351
Int. Cl. F16k *31/06*
U.S. Cl. 137—219 **6 Claims**



A valve for controlling the flow of pressurized fluid comprising a hollow, cylindrical valve body having a hollow, cylindrical obturator slidably mounted therein, the exterior of the obturator being spaced, along most of its length, from the inner surface of the body, to provide space for receiving the pressurized fluid. The space is closed at its forward end by contact means on the obturator contacting a seat on the body. The obturator is supported internally by a first male guide piece mounted from the body and slidably contacting the inner surface of the obturator at its rearward end, a rod coaxial with the obturator and supported by the first guide piece and a second male guide piece mounted on the rod and slidably contacting the inner surface of the obturator at its forward end. A piston slidably mounted within the obturator, on the rod and between the guide pieces, forms, in its forward position, a starting chamber with the second guide piece, in a position rearward of the forward position, a control chamber with the second guide piece, the rod and the inner surface of the obturator and at its rear side, a closing chamber with the rod, the first guide piece and the inner surface of the obturator. When the piston moves rearward it engages a stop on the obturator and causes it to move with the piston. A fluid duct through the rod and the second guide piece connects the start chamber to the atmosphere at the forward end of the obturator, and fluid ducts, for control purposes, extend from exteriorly of the body to the start, control and closing chambers to cause movement of the piston and hence, the obturator.

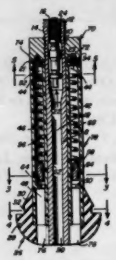
3,789,867

TIRE INFLATION VALVE WITH PRESSURE INDICATOR

Enrique M. Yabor, Miami, Fla., assignor to David Moliver, Miami, Fla.; a part interest

Filed May 17, 1972, Ser. No. 254,057
Int. Cl. F16k *37/00;* **B60c** *23/00*
U.S. Cl. 137—227 **5 Claims**

A operatively attached constantly ready-for-use self-contained tire valve and companion air pressure indicating device having an elongated barrel or tube with an axial bore, said tube providing a core for the overall device. A normally closed conventional-type tire valve is telescopingly fitted within the outer screw-threaded end portion of the bore and is accessible for attachment and association therewith of an air pump hose. The outer end portion of the tube is externally screw-threaded to accomodate a protective screw cap and also a valving nut for air exhausting and bleeding as hereinafter set forth. The inner end portion of the tube is embedded air-tight in a central or axial portion of a rubber adapter base. The base is peripherally grooved and adapted to be lodged and retentively anchored in an opening provided therefor in a portion of the tire rim. Cylinder means surrounds a predetermined portion of the tube and more specifically comprises inner and outer concentric cylinders with the space therebetween providing a pressurized air trapping chamber. Inner end portions of the cylinders are also embedded in the base. The base has slots or openings allowing the air from the tune to pay back into the



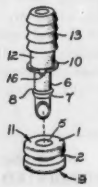
chamber. A spring-biased piston, is confined for sliding movement in the chamber and has suitable O-rings to provide shiftable but air-tight contact between inner and outer peripheral surfaces of the piston and cylinders. The outer cylinder has a graduated scale and the coordinating piston provides an indicator for measuring association with the graduations of the scale. Exhaust ports at the outer end and an opening and closing and valving nut on a threaded portion of the tube make it possible to exhaust air from the chamber to permit accurate operation of the indicator.

3,789,868

FLUID OUTLET FOR PIPES

Otto C. Menzel, Torrens Park, Australia, assignor to Iplex Plastic Industries Pty. Ltd., Elizabeth, South Australia, Australia

Filed Dec. 3, 1971, Ser. No. 204,454
Int. Cl. B23b *41/08;* **F16e** *41/04*
U.S. Cl. 137—317 **2 Claims**



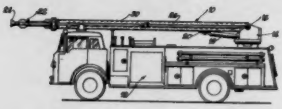
A fluid outlet for pipes which comprises an apertured grummet having a peripheral groove in the grummet engageable in an aperture in a pipe, and a nipple engageable through the aperture in the grummet to lock the grummet to the pipe and provide an opening from the pipe, a shoulder being provided optionally to engage the inner face of the grummet to prevent blowing out of the nipple under pressure. The grummet can be rotational and have a sloping inner end to effect flow control.

3,789,869

FIRE-FIGHTING APPARATUS AND ELONGATE CANTILEVER BOOM ASSEMBLY THEREFOR

Carrol V. Morris, St. Joseph, Mo., assignor to Snorkel Fire Equipment Company, St. Joseph, Mo.

Filed Jan. 24, 1972, Ser. No. 220,188
Int. Cl. B66f 9/06
U.S. Cl. 137—351 13 Claims



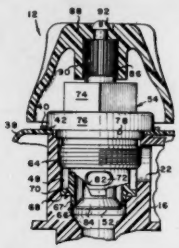
An elongate cantilever boom assembly. The assembly is fabricated from identical U-shaped extrusions. The web is thicker than the legs of the extrusion so that when the extrusions are welded together the webs which are positioned at the extreme fiber have the greatest stress resistance to provide a strong, lightweight boom. The legs define tongue and groove means, one leg defining a tongue and the other the groove so that a pair of such extrusions from a single die may be juxtaposed in tongue and groove engagement for welded securement.

3,789,870

DISPOSABLE VALVE CONSTRUCTION AND METHOD OF MAKING SEALS

Robert J. Keller, III, Richmond, Va., assignor to Kel-Win Manufacturing Company, Chester, Va.

Filed Nov. 11, 1971, Ser. No. 197,741
Int. Cl. F16k 31/38
U.S. Cl. 137—454.5 16 Claims



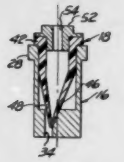
A disposable valve construction and method of making seals in which the valve member is made from a flexible material, such as plastic. A valve housing member is provided with a longitudinal bore which communicates with a fluid to be dispensed. The housing member is provided with a countersunk portion to receive therein a hollow valve member. The latter is provided with a lower cylindrical portion, the bottom surface of which functions as a valve seat for a centrally disposed stem member. The outer surface of the lower cylindrical portion provides an interference fit for the bore of the housing member. The hollow valve body member is threaded into the countersunk housing until an interference seal is initially established with the bore of the housing member. The valve body member is threaded further causing flexing of the valve body to occur as an integral annular skirt portion of the valve body engages the shoulder at the bottom of the countersink which serves as a valve seat therefor. Continued threading of the valve body establishes a controlled tension on the valve housing member by an interference in length between the valve member and the housing member between the valve seat and a bottoming out position. While the countersunk portion is threaded to receive the valve body member, the bottom of the countersink is unthreaded and is positioned to support the annular skirt portion of the valve body and prevents radial movement thereof which would cause leaking under heavy pressures.

3,789,871

VENT APPARATUS

Willis E. Tupper, Dexter, Mich., assignor to Dexter Automatic Products Co., Inc., Dexter, Mich.

Filed Apr. 19, 1972, Ser. No. 245,436
Int. Cl. F16k 15/16
U.S. Cl. 137—493.2 7 Claims



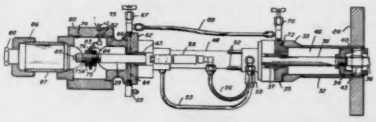
Apparatus for venting gasoline tanks for snowmobiles, chain saws, yard or garden tractors, and the like, which comprises a tubular fitting that is mounted on the outside of the tank in communication with the interior of the tank, and a check-relief valve assembly mounted in the outer end of the fitting to allow air to enter the tank and excessive gas vapor pressures to escape from the tank, but which will prevent discharge of liquid gasoline. The valve assembly includes a resilient unitary valve element that has a duck bill portion, and means are provided to urge the lips of the duck bill portion together so that an effective liquid gasoline seal is provided but which will not interfere with venting of the tank.

3,789,872

HYDRAULIC CONTROL MEANS FOR CHECK VALVES

Robert E. Elliott, 5336 E. 6th, Tulsa, Okla.

Filed May 31, 1972, Ser. No. 258,452
Int. Cl. F16k 21/10
U.S. Cl. 137—514 7 Claims



This invention describes an improved hydraulic control means for a check valve in a gas pipeline. A hydraulic cylinder which is nominally operated at a low pressure has a piston which is connected by connecting rod to the clapper of the valve. As the clapper opens under gas pressure in the pipeline, hydraulic liquid is permitted to pass from one side of the piston to the other through a controlling choke valve with bypass, so that the piston offers nominal resistance to the movement of the opening clapper. On the other hand, when the gas flow in the pipeline reverses, and the clapper tends to close, the check valve prevents flow to the first bypass around the piston, and forces the liquid flow around the piston through an orifice or restriction of controlled size, so as to control the rate at which the clapper is permitted to close. This prevents high velocity slamming of the clapper against its seat.

3,789,873

PNEUMATIC PRESSURE TRANSMITTING DEVICE

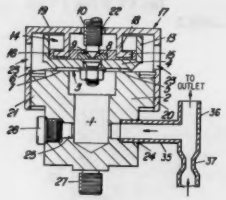
Herbert Wilfred Westwood, Orpington, England, assignor to Darenth Weighing Equipment Limited, Kent, England

Filed Oct. 8, 1971, Ser. No. 187,693

Claims priority, application Great Britain, Oct. 15, 1970, 49,093/70

Int. Cl. G01g 5/00

U.S. Cl. 137—514.3 5 Claims



A pneumatic pressure transmitting device for transmitting a pneumatic pressure which is in linear relation to a variable applied force, of the kind comprising a pneumatic pressure chamber having an inlet duct with throttling means for admitting air under a pressure greater than that to be transmitted, and an outlet duct in communication with the inlet duct downstream of the throttling means, and a pneumatic pressure relief opening which is closed by a loose cover which engages a seating surrounding the opening, the cover being acted upon by a damper which damps its movement off and on to the seating to prevent it from vibrating and also acted upon by a member by which the variable force is applied to it as a thrust along a line of action in alignment with the resultant of the pneumatic pressure in the chamber acting on the cover, so that when a force is applied to the member and air is supplied under pressure through the inlet duct, the pressure in the chamber increases until the cover is moved off its seating against the applied force to allow air to escape from the opening to such an extent that equilibrium is established between the oppositely acting pressure and force on the cover, the equilibrium pressure which is in linear relation to the force being transmitted through the outlet duct, the device being provided outside of the pneumatic pressure chamber with a receptacle for receiving oil or other damping liquid, and the damper including a plate which is supported near the bottom of the receptacle where, in use, it is submerged in the damping liquid, one part, that is either the receptacle or the plate being rigid with the cover and the other part, that is the plate or the receptacle respectively, being rigid with the body containing the pneumatic pressure chamber.

3,789,874

CHANGING BIAS CHECK VALVE

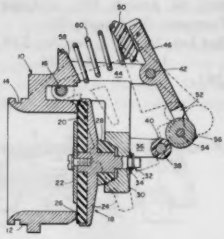
David A. Hills, Abington, Mass., assignor to Hersey Products Inc., Dedham, Mass.

Filed July 13, 1972, Ser. No. 271,625

Int. Cl. F16k 15/03

U.S. Cl. 137—527 8 Claims

A check valve in which clapper bias torque diminishes as the clapper opens, a clapper support carrying pivotally mounted thereon a clapper assembly and (pivotally mounted intermediately thereof) a cam arm, a compression spring extending between the clapper support and one end of the cam arm causing the other end of the cam arm to impose a bias force on the clapper assembly, the bias force being imposed along a plane defined by a transverse line near said other end of the cam arm and a transverse line on the clapper assembly. In a preferred embodiment the force is imposed from a stainless steel roller rotatably mounted in said other end of the cam arm to a plastic roller rotatably mounted at the downstream end of the clapper assembly.



3,789,875

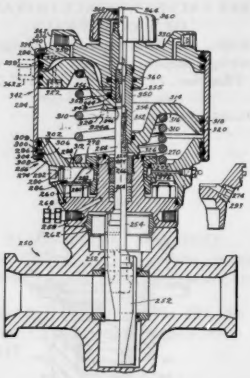
FLUID PRESSURE ACTUATED VALVE OPERATOR

John K. McGee, Houston, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed May 15, 1972, Ser. No. 253,512

Int. Cl. F16k 31/143, 37/00

U.S. Cl. 137—553 11 Claims



The valve operator preferably includes electrical or fluid pressure means for indicating the open or closed condition of the valve at a remote location. Means are provided for exerting additional valve operating force, should the normal manual and/or automatic actuator prove insufficient. The valve operator is constructed to be easily installed and serviced.

3,789,876

SOLENOID VALVE WITH ELECTRONIC POSITION INDICATOR

Calvin E. Kempton, Laguna Hills, and Robert H. Reinicke, Mission Viejo, both of Calif., assignors to Parker Hannifin Corporation, Cleveland, Ohio

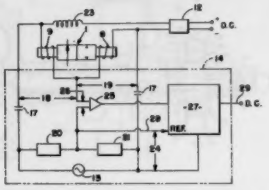
Filed Apr. 6, 1973, Ser. No. 348,747

Int. Cl. F16k 37/00

U.S. Cl. 137—554 16 Claims

A solenoid valve with an electronic position indicator in which the armature of the solenoid coil means is itself the movable valve member or is operatively coupled with the movable valve member characterized in that the solenoid coil means is hooked up as an inductance bridge to an AC power

source, the armature being effective to vary the relative inductances of the legs of the bridge according to the position of the armature with respect to said solenoid coil means, the voltage drops at the juncture of the legs being compared with in-phase reference voltages and resolved by a phase detector



having an output which indicates the position of the armature and thus indicates the position of the valve. The invention herein is further characterized in that the armature is actuated by DC energization of the solenoid coil means and in that the position indicator has condensor means to prevent the DC voltage from entering the position indicating circuitry.

3,789,877

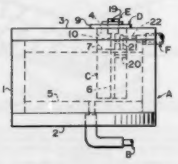
VISUAL AUTOMATIC LIQUID FEEDER

Tore H. Noren, and George J. Federichi, both of 1350 Donner Ave., San Francisco, Calif.

Filed Mar. 13, 1972, Ser. No. 234,232

Int. Cl. G01f *15/00*

U.S. Cl. 137—590 **2 Claims**



A visual automatic liquid feeder having a fluid holding container with a transparent wall and an inlet pipe for fluid communicating with the container at its bottom. The top of the container carries a depending dip tube that extends downwardly into the container and has its lower end spaced a slight distance above the container bottom. An axial bore in the dip tube extends from the lower end of the tube and communicates with an output pipe for the fluid. A suction on the outlet pipe causes fluid in the container to flow into the pipe. An adjustable valve controls the flow of fluid passing from the container through the axial bore in the dip tube and out through the outlet tube. A radial branch bore in the dip tube leads from the axial bore to the top of the container interior so as to create a vacuum in the container that will draw fluid through the inlet pipe into the container until the fluid closes the entrance end of the radial branch bore.

3,789,878

DEAD BED PROTECTIVE SLEEVE FOR USE IN PROCESSING TACONITE

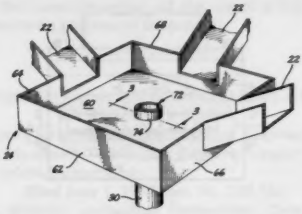
Byron G. Rowell, Virginia, Minn., assignor to I. R. A., Incorporated, Hibbing, Minn.

Filed Jan. 24, 1972, Ser. No. 219,943

Int. Cl. B03b *1/00*

U.S. Cl. 137—590 **10 Claims**

To minimize the amount of wear at the outlet or discharge pipe in the bottom of a tank or box through which a liquid or slurry containing abrasive particles flows, such as in the processing of taconite, a dead bed protective sleeve of a material having abrasion-resistant properties is employed, the sleeve having a flange that overlies the bottom of the box circumjacent the outlet pipe and also having a cylindrical portion depending downwardly into the outlet pipe. The flange functions as a dam or baffle so that the particles build up



therearound to provide a cushioning effect which protects the bottom of the box in this region. The joint where the outlet pipe is connected to the box is also protected. Still further, the upper portion of the outlet pipe where turbulent action occurs is protected by the depending cylindrical portion of my sleeve.

3,789,879

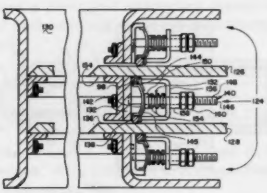
SELF-ADJUSTING SEALING APPARATUS

Elden A. Hale, Pikesville, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 20, 1972, Ser. No. 245,880

Int. Cl. F16k *25/00*

U.S. Cl. 137—614.11 **21 Claims**



A self-adjusting sealing apparatus for sealing a space between the wall of an enclosure and an irregular surface on a closure gate which moves substantially perpendicularly through the enclosure to block a flow of gas through the enclosure. A sealing element acts against the wall of the enclosure and the irregular surface thereby preventing gas within the enclosure from escaping between the wall and the closure gate. A resilient retaining mechanism urges the sealing element against the wall of the enclosure and against the irregular surface of the closure gate for maintaining the sealing element in sealing engagement with the wall and the irregular surface during movement of the closure gate into and out of the enclosure and when the gate is in any of its open, closed, or intermediate positions.

3,789,880

POROUS METAL FLOW CONTROL SPOOL

Dan F. Armstrong, and George F. Armstrong, both of Saint Albans, W. Va., assignors to Chem Valley Machines, Inc., St. Albans, W. Va.

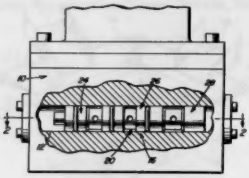
Filed Jan. 4, 1972, Ser. No. 215,318

Int. Cl. F16k *3/32, 47/14;* **F15d** *1/10*

U.S. Cl. 137—625.3 **8 Claims**

A flow control spool having first, second, and third separate cylindrical spool parts, and a pair of porous metal discs arranged in the second spool part for controlling the flow in a

flow path defined by the spool. The spool parts are hollow with an end of the first and third spool parts being enclosed, and each spool part is provided with ports which cooperate with passages in a valve block in which the spool is arranged for defining a flow path system.

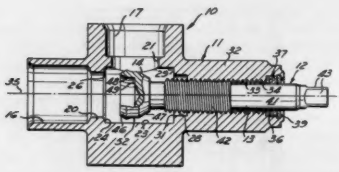


3,789,881

REFRIGERATION SERVICE VALVE

Robert E. Kozulla, Willowick, and Richard J. Silagy, Parma, both of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed Mar. 31, 1972, Ser. No. 240,096
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.48 **8 Claims**



A valve assembly and method of making the same particularly suited for use as a double seat refrigeration valve comprising a body which has an internal poppet receiving chamber and a pair of valve seats at opposite ends of the chamber with one seat associated with an axial port and the other seat associated with an axial stem guide bore. The poppet has an initial outer diameter at least as small as the axial port seat to permit it to be positioned in the chamber through the axial port and is adapted to be plastically expanded radially outwardly by a flaring tool to a final diameter larger than the axial port seat so it is capable of sealing the port to prevent fluid communication between the axial port and a second port in the chamber. The poppet includes a sealing surface adapted to seal the stem guide bore seat when the poppet is moved away from the axial port seat.

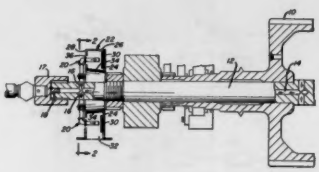
3,789,882

DISCHARGE COLLECTOR FOR FLUID COOLED ROLL

Fay R. Edmonson, Birmingham, Ala., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 25, 1972, Ser. No. 283,865
Int. Cl. B21b *27/06, 27/08*
U.S. Cl. 137—802 **6 Claims**

A discharge collector for a fluid cooled roll has a nozzle engaging each radial fluid outlet in the shaft of the roll, and a collecting chamber surrounding the shaft into which chamber the nozzles protrude and emit cooling water. An alternative embodiment includes a sleeve having an internal water passageway attached to the roll and communicating with the radial fluid outlets, and one or more nozzles engaging the sleeve to deliver discharged cooling water to the collecting chamber.

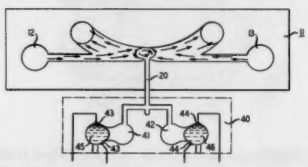


3,789,883

PUSH-PULL FLUIDIC LOGIC ELEMENT AND DRIVE UNIT

Donald Lee De Gregory, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 2, 1972, Ser. No. 294,368
Int. Cl. F15c *1/20*
U.S. Cl. 137—824 **1 Claim**



A fluidic logic element and drive unit is disclosed which performs the half adder logic function of a passive AND gate but has a single output capable of giving two distinct output signals. The element has opposed aligned input nozzles and diverters arranged so that an output port is pressurized by the simultaneous presence of input signals at each nozzle and is evacuated by an atomizer effect when an input is present at either nozzle alone. The AND signal is indicated by a pressure at the output, while the OR signal is indicated by a vacuum at the output.

3,789,884

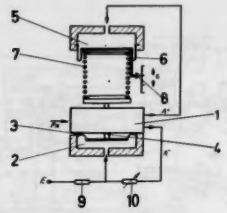
PNEUMATIC PRESSURE POSITION ADJUSTING CONTROLLER

Horst Bader, Stuttgart, Germany, assignor to J. C. Eckardt AG, Stuttgart, Germany

Division of Ser. No. 128,042, March 25, 1971, Pat. No. 3,721,422. This application Jan. 19, 1973, Ser. No. 325,063
Int. Cl. F15c *3/04*
U.S. Cl. 137—832 **13 Claims**

A pneumatic pressure position adjusting controller which includes a differential pressure amplifier providing first and second output pressures from a comparison unit responsive to pressures provided by the first and second pressure chambers,

the second output pressure from the differential pressure amplifier being compared to an input pressure by a pressure distributor which applies a control pressure to the second pressure chamber, the first output pressure of the differential pressure amplifier being applied to the first pressure chamber.



3,789,885

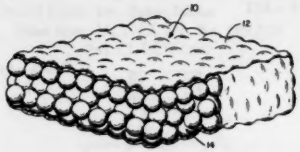
INTERNALLY SUPPORTED THIN WALLED DUCT

Joseph R. Wilson, Hutweidengasse 10 A-1190, Vienna, Austria

Continuation-in-part of Ser. No. 51,650, July 1, 1970, Pat. No. 3,732,919. This application May 18, 1972, Ser. No. 254,563

Int. Cl. F16l *55/00*

U.S. Cl. 138—103 **6 Claims**



A thin walled duct, operating at reduced pressure, is maintained rigid by an internal packing of particles that does not materially affect low velocity fluid flow through the duct.

3,789,886

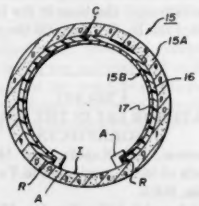
LINED CONDUIT

Thomas K. Breitfuss, Tustin, Calif., assignor to Hydro Conduit Corporation, Newport Beach, Calif.

Filed July 27, 1972, Ser. No. 275,793

Int. Cl. F16l *9/14*

U.S. Cl. 138—146 **6 Claims**



A closed conduit has a liner for the crown thereof, the conduit being ordinarily subject to flow in the invert portions thereof of a liquid bearing a corrosive vapor or a vapor which is converted to a corrosive liquid. The liner is formed from a rectangular essentially planar corrosion resistant sheet of deformable material having memory characteristics causing the material to tend to revert to its undeformed condition. The sheet is deformed and constrained to define a tube having a diameter less than the diameter of the conduit, and is inserted into the conduit. Structure is disposed within the conduit adjacent at least to one side of the flow line thereof to engage the longitudinal edge of the sheet and restrain the edge in position upon release of the constraint of the sheet, so that when the sheet returns to its undeformed state to line the crown of the conduit, the corrosive action of the vapor is not manifest against the crown portions of the conduit.

3,789,887

ARRANGEMENT FOR RECIPROCATING A WEFT INSERTER ROD

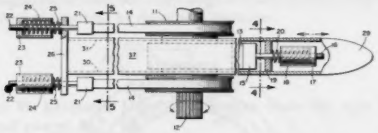
Arnold Peter, Lichteneiche uber Bamberg, Germany, assignor to Ruti Machinery Works Ltd. formerly Caspar Honegger, Ruti (Zurich), Switzerland

Filed June 1, 1972, Ser. No. 258,765

Claims priority, application Switzerland, June 2, 1971, 8030/71

Int. Cl. D03d *47/00*

U.S. Cl. 139—123 **12 Claims**



The present invention relates to an arrangement for reciprocating a weft inserter rod for inserting picks into a shed of a weaving machine. The arrangement comprises a driving wheel rotating in both clockwise and counterclockwise directions about a pivot and connecting means transmitting the movement of the driving wheel to reciprocating motion of the inserter rod.

3,789,888

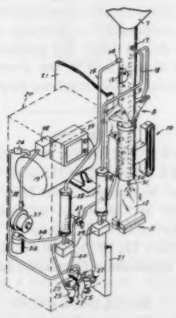
GAS FLUSHING SYSTEM FOR VERTICAL FORM, FILL AND SEAL MACHINES

Robert C. James; David A. Wilson, and Frank E. Pringle, Jr., all of Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Division of Ser. No. 888,615, Dec. 29, 1969, Pat. No. 3,664,086. This application Sept. 27, 1971, Ser. No. 184,165

Int. Cl. B65b *1/04, 3/04*

U.S. Cl. 141—4 **10 Claims**



Gas flushing is effected by introducing the gas through one or more ducts into a free portion of the vertical package forming, filling and sealing tube above the area to which packaging sheet material is fed onto and tubularly formed about the tube. At least one of the ducts communicates with an extension duct nozzle depending within the tube for releasing and distributing flushing gas onto the product delivered through the tube into

the form packaging bags. Pre-purging gas may be introduced into the tube upstream from the flusihing gas. Gas sampling and machine start-up pre-flushing may be effected through a duct having a combination inlet and outlet located to extend partially downwardly into the bag to be filled or which may have been last filled when the machine is restarted after a shut-down.

3,789,889

CONTROL ARRANGEMENT FOR A VESSEL FILLING MACHINE

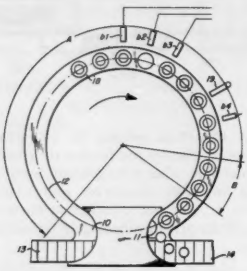
Rudolf Riedel, Bad Kreuznach; Felix Zelder, Munster-Sarmsheim, and Horst Gilles, Bad Kreuznach, all of Germany, assignors to Seitz-Werke G.m.b.H., Bad Kreuznach, Germany

Filed Feb. 14, 1972, Ser. No. 226,168

Claims priority, application Germany, Feb. 16, 1971, P 21 07 226.4

Int. Cl. B65b *57/02*

U.S. Cl. 141—140 **10 Claims**



A vessel filling machine having a conveyor for conveying vessels to be filled in spaced relation through a filling region in which filling devices engage the vessels from above. In the absence of a vessel in a respective position of the conveyor, the respective filling device will move beyond the normal vessel engaging position thereof to a second position.

Feeler elements are located along the filling region for detecting the positions of the filling devices. In the event a complete vessel is absent from a position on the conveyor, the feeler elements cooperate to actuate an instrumentality designed to clear debris from the position from which the complete vessel is absent and in the event the debris is not cleared from the position, the machine stops.

3,789,890

ROTATING VESSEL PROCESSING MACHINE, ESPECIALLY VESSEL FILLING MACHINE

Rudolf Riedel, Bad Kreuznach, and Felix Zelder, Muenster-Sarmsheim, both of Germany, assignors to Seitz-Werke G.m.b.H., Bad Kreuznach, Germany

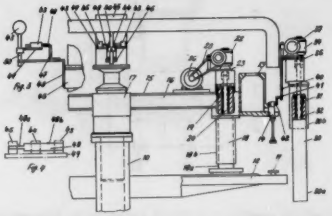
Filed Dec. 22, 1971, Ser. No. 210,785

Claims priority, application Germany, Jan. 5, 1971, P 21 00 284.6

Int. Cl. B65b *43/50*

U.S. Cl. 141—144 **11 Claims**

A machine, especially for filling vessels in which a rotary table has circumferentially distributed vessel supports thereon. Mounted on the table for vertical movement thereon is a machine part having valve controlled filling devices to engage the vessels. A further machine part having valve actuating means is supported above the first mentioned machine part, and is also vertically moveable. Screw drives are connected to the machine parts and have drive motors with one of the motors manually controlled and with the other of the motors being controlled in response to relative movement of the machine parts so that the machine parts maintain a certain relationship relative to each other.



3,789,891

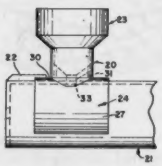
B-B GUN FUNNEL DEVICE

James D. Bosch, 892 E. Main, Valley City, N. Dak.

Filed Mar. 2, 1972, Ser. No. 231,225

Int. Cl. B65b *39/00*

U.S. Cl. 141—331 **1 Claim**



The invention comprises a funnel device. The funnel device is for attachment to the barrel of a B—B gun having a bore therein for filling a magazine in the barrel of the B—B gun. The funnel device has a funnel with a clamp mounted to the bottom of the funnel. The clamp is detachably mounted to the barrel of the B—B gun so that the bore in the funnel aligns with the bore in the barrel of the gun so that B—B's may be fed into the funnel through the bore in the funnel and into the bore in the barrel of the B—B gun to fill the magazine of the B—B gun with B—B's.

3,789,892

TEMPLATE FOR USE IN THE ROUTING OF WORKPIECES

Gordon L. Converse, Elk Rapids, and Merle C. Mihulka, Boyne City, both of Mich., assignors to Twin Bay Industries, Inc., Elk Rapids, Mich.

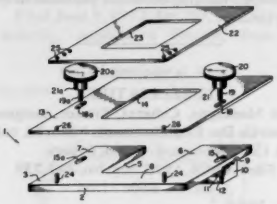
Filed Apr. 15, 1971, Ser. No. 134,278

Int. Cl. B27c *5/10*; **B23q** *35/44*

U.S. Cl. 144—144.5 **7 Claims**

A routing template comprises a body adapted to overlie a workpiece to be routed and having an opening formed in the body for the accommodation of a routing tool. Atop the body is carried a plate having a predetermined thickness and having an opening therein of an area corresponding to the area of the workpiece to be routed, the area of the opening in the plate being no greater than that of the opening in the body and communicating with the latter. The plate may be replaced by any

one of a number of other plates of different thickness and having openings of different sizes so as to vary the depth and area

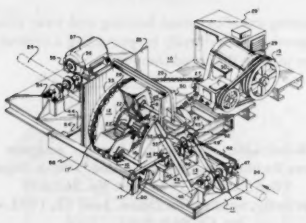


of the cut made in a workpiece. The body is provided with means for clamping and unclamping the body to the workpiece to be routed.

3,789,893
DELIMBER-DEBARKER

Loren A. Carson, 1501 S. Capital Blvd., Boise, Idaho; R. S. Tremewan, 4405 Gauge, Boise, Idaho, and Ronald C. Yanke, 10425 Estate Dr., Boise, Idaho

Filed Sept. 15, 1972, Ser. No. 289,715
Int. Cl. B27l *1/00*
U.S. Cl. 144—208 E **3 Claims**



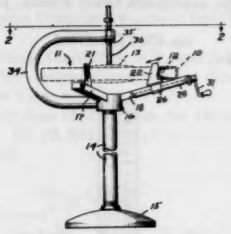
The delimber-debarker comprises a suitable frame, a cutter carriage carried in the frame and being driven by a motor through a sprocket and chain, a plurality of cutting heads mounted on journaled shafts provided with pinions operable to engage a ring gear on the carriage and to drive the cutting heads carried in each of the respective cutters, and a feed assembly carried on the frame and being operable to drive a log through the carriage and between the cutters.

3,789,894
STAND FOR MOTORCYCLE WHEELS

John Walker Adams, Post Office Box 308, Bar Mills, Maine

Filed July 20, 1972, Ser. No. 273,386
Int. Cl. B25h *5/00*
U.S. Cl. 144—288 A **5 Claims**

A stand is disclosed for use in changing motorcycle tires. The stand has three upwardly and outwardly inclined wheel supporting arms, each provided with rim-clamping dog, and a support holding a depending rod in vertical alignment with the center of the stand. One arm has means connected to and operable to move the associated dog into clamping engage-

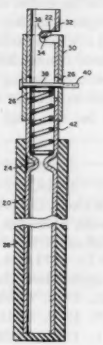


ment with the rim of the supported wheel and to bring the rim into engagement with the other dogs whose positions may also be shifted as required by the wheel diameter.

3,789,895
NAIL HOLDER

Walter W. Levinson, 101 Conshohocken State Rd. Apt. 3C, Bala Cynwyd, Pa.

Filed Oct. 5, 1971, Ser. No. 186,642
Int. Cl. B25c *3/00*
U.S. Cl. 145—46 **1 Claim**



The invention relates to a hand tool intended for use as a holder for nails of all sizes, including brads. A tubular barrel has a side nail-gripping slot near one end, an interior spring abutment in the barrel removed from that end and cooperating longitudinal pin slots between the nail-gripping slot and the spring abutment, a sleeve surrounding and telescoping around the barrel having near one end a gripping face, preferably including a socket and an inclined gripping wall, which cooperates with the nail-gripping slot to grip a nail, a pin extending through the sleeve and through the cooperating longitudinal slots in the barrel, a compression spring within the barrel acting between the spring abutment and the pin and gripping means projecting from the sleeve preferably extending a substantial distance to the side in prolongation of the pin and as an extension from the pin. In the preferred embodiment the limiter for the telescoping motion of the sleeve is the ends of the cooperating longitudinal slots in the barrel.

3,789,896

SCREWDRIVERS AND LIKE TOOLS

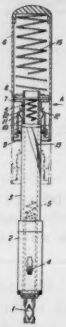
Eustace Cooke-Yarborough, 49a Maresfield Gardens, Hampstead, London NW 3, England

Filed June 14, 1972, Ser. No. 262,446

Claims priority, application Great Britain, June 22, 1971, 29,136/71

Int. Cl. B25b *17/02*

U.S. Cl. 145—54 6 Claims



A screwdriver or like tool incorporating a rotatable shaft which is driven by axially movable members mounted therein, and having helical drive connection therewith, is provided with two helical grooves of different pitch associated with corresponding drive means, whereby the shaft is driven at comparatively high speed when encountering comparatively low resistance torque, and is thereafter driven at lower speed but with greater applied torque when the resistance increases. The shaft may be fitted with a hollow, axially movable handle, having pin and helical groove connection therewith, to form said higher-torque driving means. Spring means may be provided to prevent relative axial movement of handle and shaft until the resistance torque on the shaft exceeds a prearranged value.

3,789,897

PACKING CONTAINERS

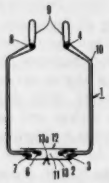
Akio Saito, Kakegawa-shi, Shizuoka, Japan, assignor to Shinwa Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 13, 1971, Ser. No. 179,934

Claims priority, application Japan, Sept. 11, 1970, 45/89922 [U]; Sept. 12, 1970, 45/90333 [U]; Nov. 11, 1970, 45/111319 [U]; Nov. 30, 1970, 45/118256 [U]; Dec. 26, 1970, 45/118581 [U]; Feb. 1, 1971, 46/3898 [U]; Mar. 19, 1971, 46/18446 [U]

Int. Cl. B65d *29/02*

U.S. Cl. 150—11 19 Claims



In a container, a double walled cylindrical body is formed by turning inside out a pliable cylindrical member at about the center of the length thereof, first and second binding cords are threaded about the lower ends of the inner and outer layers of the cylindrical body and are tied to substantially close the bottom of the cylindrical body, a third binding cord is threaded about the upper end of the cylindrical body to close the upper end thereof and a plurality of circumferentially spaced apart closed loop shaped hanging cords are provided to encircle the third binding cord.

3,789,898

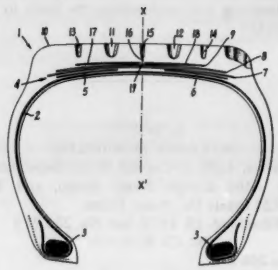
TUBELESS TIRES

Jean Bernard Montagne, Cebazat, France, assignor to Compagnie Generale Des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, France

Filed Apr. 6, 1972, Ser. No. 241,739

Int. Cl. B60c *11/06*

U.S. Cl. 152—209 R 3 Claims



A tire having excellent road-holding and wear properties is further improved behaviorally by providing a central articulation zone or joint in the tread thereof.

3,789,899

PNEUMATIC TIRES

Takashi Kobayashi, Fujisawa, Japan, assignor to The Yokohama Rubber Company, Limited, Tokyo, Japan

Filed June 12, 1972, Ser. No. 261,675

Claims priority, application Japan, June 12, 1971, 46/41409

Int. Cl. B60c *9/02*, *15/04*

U.S. Cl. 152—356 7 Claims

A pneumatic tire in which the tire is built by arranging a layer of an elastic material, such as rubber, radially outwardly of a reinforcement layer extending from one bead region to the other bead region of the tire and formed of at least one reinforcement member which has its one end located at either one of the bead regions and is wound up helically or circumferentially in a direction at an angle of 0° to 20° with respect to the rotating direction of the tire, whereby the number of the cut ends of said at least one reinforcement member is substantially decreased, the resistance of the tire to centrifugal force is increased over the entire area of the tire, the occurrence of steady wave is prevented and the tire withstands high speed rotation.

3,789,900

PNEUMATIC TIRES

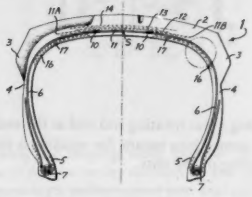
Henri Verdier, Beauregard-L Eveque, France, assignor to Compagnie Generale Des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, France

Filed June 9, 1972, Ser. No. 261,379

Claims priority, application France, June 15, 1971, 7121773

Int. Cl. B60c *9/04, 9/18*

U.S. Cl. 152—356 8 Claims



A tire of reduced weight and greater strength is obtained by restraining the radial carcass on the inside by means of a shoulder ply arranged on the inside of the carcass at each end of the crown reinforcement so as to impart a nearly rectangular meridian profile to the carcass.

3,789,901

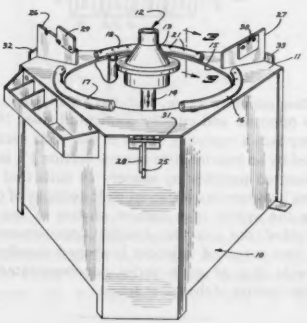
METHOD AND APPARATUS FOR INFLATING TUBELESS TIRES AND THE LIKE

Sigurd A. Rishovd, Minneapolis, Minn., assignor to Royal Industries, Inc., Osseo, Minn.

Filed Jan. 31, 1972, Ser. No. 222,167

Int. Cl. B60c *25/12*

U.S. Cl. 157—1.1 8 Claims



Apparatus for inflating a tubeless tire on the wheel of a vehicle which is operable for tires and wheels of different sizes. A work surface, with a circular aperture dimensioned to removably accept a wheel of the largest diameter to be used, is provided with a plurality of annularly spaced, upwardly, inwardly directed sources of air under pressure. A plurality of support members of adjustable height are disposed radially outwardly of the sources of air. A wheel and deflated tire are then disposed over the inflating apparatus with the bottom side wall of the tire engaging the top of the apparatus radially outwardly of the sources of air and the top bead of the tire supporting the upper rim of the wheel. The height of the wheel and tire above the plane of the sources of air is determined by the size of the wheel. Once the tire and wheel are disposed in proper position, a substantial quantity of air under pressure is emitted from the sources of air and supplied to the normal valve on the wheel and the tire is seated and inflated almost instantaneously.

3,789,902

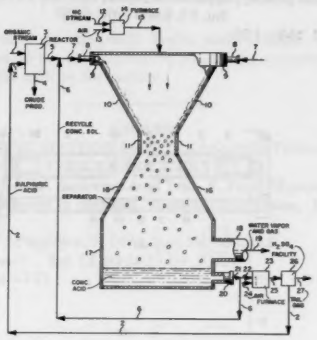
METHOD FOR CONCENTRATING DILUTE ACIDIC SOLUTIONS

Indravadan S. Shah, Forest Hills, N.Y., and John B. Rinckhoff, Lakeland, Fla., assignors to Chemical Construction Corporation, New York, N.Y.

Filed June 18, 1971, Ser. No. 154,366

Int. Cl. B01d *1/16, 1/22, 1/16*

U.S. Cl. 159—49 7 Claims



Dilute aqueous acidic solutions are concentrated by direct contact with a hot gas stream in a venturi contactor, under specific conditions of the ratio of total solution flow rate to hot gas flow rate, and hot gas flow velocity at the throat section of the venturi passage, so that the acidic liquid solution is concentrated by evaporation of water vapor into the hot gas stream without the formation of an acid mist or other contaminants in the gas stream.

3,789,903

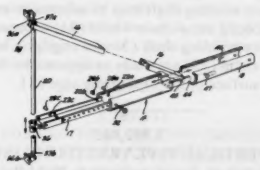
HIGHLY COMPACT STABLE AWNING FOR TRAVEL TRAILERS, MOTOR HOMES AND/OR CAMPERS

Robert Clement Clark; Pauline Cecilia Clark, both of 8651 Foothill Blvd., No. 84, Cucamonga, Calif., and Robert Bevan Clark, 6318 Napa Ave., Alta Loma, Calif.

Filed Nov. 1, 1971, Ser. No. 194,343

Int. Cl. E04f *10/06*

U.S. Cl. 160—75 3 Claims



Compact stabilized awning unit and support structure therefor having triangulated tension and/or compression bearing support elements for collapsible awning units that are adjustable for variable extended positions or collapsible into a nesting integrated unit are provided for, and attached to vehicles such as travel trailers, motor homes and/or campers. The awning unit and/or the support structure is comprised of a vertical slide adapted to be fixed to a wall, a main support secured in sliding relation at a first end thereof to said slide, an auxiliary support secured at one end thereof to the main support in-

termediate the ends thereof and at its other end adapted to be secured to the wall above said main support first end, a torque spring loaded roller supported by said main support at its second end, and a flexible cover having its outer end windably secured to said roller and its inner end adapted to be secured to said wall.

3,789,904

DOUBLE CURTAIN DEVICE

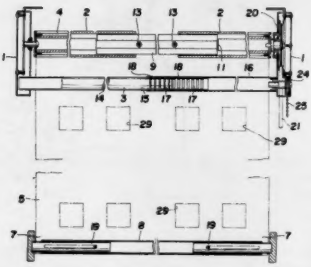
Ietsugu Takazawa, Bancho Habitation 901, 3, Sanbancho Chiyoda-ku, Japan

Filed Jan. 15, 1973, Ser. No. 323,363

Claims priority, application Japan, Apr. 24, 1972, 47/47543

Int. Cl. E06b *9/08, 9/20*

U.S. Cl. 160—120 **1 Claim**



A double curtain device wherein a curtain (5) provided with punched patterns (29) is connected at the respective ends with a main winding shaft (2) and auxiliary winding shaft (3) both rotatably provided between right and left supporting cases (1), a balance weight shaft (8) is inserted and held in a folded part (7) of the curatin (5) so as to tension the curtain (5), a joint (9) is slidably fitted to the main winding shaft (2) so that the length of the main winding shaft (2) may be adjustable, said auxiliary winding shaft (3) is formed by fitting a small diameter tube (15) provided with an axial groove (14) cut on one side into a large diameter tube (16) provided also with an axial groove (14) cut on one side, many annular concave grooves (17) and annular convex parts (18) fitting them are formed respectively in the fitting parts of the small diameter tube (15) and large diameter tube (16) so that the length of the auxiliary winding shaft may be adjustable and a winding chain (25) is hung on a chain wheel (24) secured to one end of the auxiliary winding shaft (3) and engaging holes (26) for said winding chain (25) are made as opposed to the chain (25) on the lower surface of the supporting case (1).

3,789,905

VERTICAL TYPE VENETIAN BLIND

Yasuji Saito, Atsugi, Japan, assignor to Nichi-Bei Blind Kogyo Kabushiki Kaisha, Tokyo, Japan

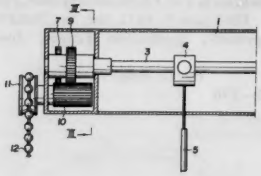
Filed Aug. 21, 1972, Ser. No. 282,066

Claims priority, application Japan, Aug. 22, 1971, 46-63778; Nov. 1, 1971, 46-87023; Dec. 6, 1971, 46-98403; Dec. 16, 1971, 46-102372; Jan. 17, 1972, 47-7168; Jan. 17, 1972, 47-7169

Int. Cl. E06b *9/30*

U.S. Cl. 160—168 **12 Claims**

An operating device for a vertical type venetian blind is set forth. A single control means is provided to feed and rotate slats of the blind. By operating the single control means, a travelling gear moves in axial direction, while rotating; and in a part of its axial movement it comes into engagement with a



gear for rotating a slat rotating rod and at the ends of said axial movement it comes into means for rotating a slat feeding rod to initiate feeding of the slats.

3,789,906

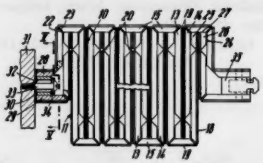
FOLDING WALL OR DOOR

Gunter Viol, Oldenburg, and Werner Kohfeldt, Bloh, both of Germany, assignors to Lignacord GmbH, Oldenburg, Germany

Filed Apr. 14, 1972, Ser. No. 244,192

Int. Cl. E06b *03/48*

U.S. Cl. 160—199 **8 Claims**



A folding panel structure, useful as a wall, partition or door, has two opposite and equally configured sides 10, 11. Each side comprises a repeating series of two wide sections 13, 14 separated by an intermediate narrow section 15, and the sides are connected together by spacers 24 such that the fold or hinge line between two adjacent wide sections of one side lies opposite the center of a narrow section of the other side. When folded, the structure roughly approximates, in cross-section, two series of adjacent U-shaped members with the side-by-side legs of each series accommodated or nested within the cavities of the other series.

3,789,907

MOLDING METHOD WITH SHIELDING MEMBER DRAWN AGAINST PARTICULATE MATERIAL

Kunii Nakata, Nagano City, and Yoshimasa Kubo, Susaka City, both of Japan, assignors to Kabushiki Kaisha Akita and Kabushiki Kaisha Akita and Kunii Nakata, both of Susaka City, Japan

Filed Sept. 21, 1971, Ser. No. 182,476

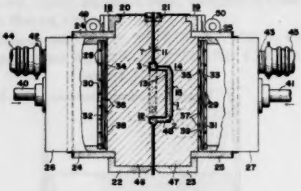
Claims priority, application Japan, June 25, 1971, 46/463

Int. Cl. B22c *15/22*

U.S. Cl. 164—7 **5 Claims**

A molding method comprising steps of bringing a shielding mold member into contact with the shaping surface of a shaping mold member to provide a mold assembly, filling a charge of a heat resisting particulate material in space disposed opposite the shaping mold member with respect to the shielding mold member, rendering negative the internal pressure of the

space containing the charge so as to draw the shielding mold member toward the charge and cause the same to adhere



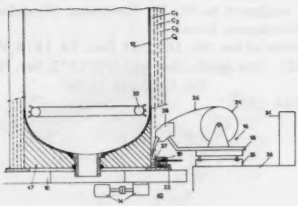
thereto, removing the shaping mold member from the mold assembly so as to form a cavity defined by the shielding mold member, and pouring a molten metal into said cavity.

3,789,908

MANUFACTURE OF HOLLOW CYLINDRICAL BODIES

Gabriel Ruget, St.-Etienne, France, assignor to Compagnie Des Ateliers Et Forges De La Loire Saint Chamond Firminy, Saint Etienne, Jacob Holtzer, C.A.E.L., Paris, France

Filed Aug. 28, 1970, Ser. No. 67,887
Claims priority, application France, Sept. 3, 1969, 6930004
Int. Cl. B22d *27/02*; **B23d** *19/00*
U.S. Cl. 164—52 **12 Claims**



A method of producing a hollow cylindrical body of revolution in which there is welded to the outer peripheral surface of a metal sleeve a lower molten metal by means of a ring of molten metal surrounding the sleeve and the sleeve and ring of molten metal being relatively vertically displaceable. Other external layers can be applied successfully by the same method.

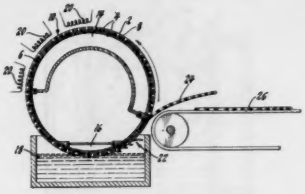
3,789,909

DIP CASTING METHOD USING TRANSPIRATIONALLY COOLED MOLD HAVING RELIEVED IMPERVIOUS OUTER LAYER

Oscar H. Smith, Muncie, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1972, Ser. No. 304,353
Int. Cl. B22d *11/06*
U.S. Cl. 164—87 **3 Claims**

In a dip casting process, a die is provided having a porous metal body, an impervious outer layer, a relieved surface on the outer layer and mold cavity in the porous body opening through the outer layer. The relieved surface provides a plurality of peaks/ridges for limited area contact with the melt. In operation, air is blown through the porous metal and out the porous walls of the mold cavity to cool them, and the impervious layer is heated to a temperature where casting metal will not adhere to the surface after the die leaves the melt. Shallow die immersion in the melt limits melt contact to the peaks/ridges on the surface thereby precluding any substantial chilling of the melt on the surface.

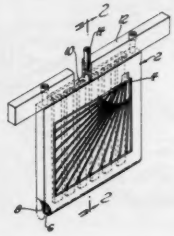


3,789,910

DIP CASTING METHOD USING TRANSPIRATIONALLY COOLED MOLD CAVITY

Robert C. Matter, Anderson, and Leon F. Paul, Muncie, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1972, Ser. No. 304,352
Int. Cl. B22d *23/04*, *25/04*
U.S. Cl. 164—121 **5 Claims**



A method and die for forming intricate, thin-sectioned castings. A die is provided having a porous metal body, an impervious surface and a mold cavity through the surface and in the porous body. The impervious surface is heated to a melt-metal-shedding temperature at which the casting metal does not adhere to the surface upon its removal from the melt. Air is introduced behind the mold cavity and exits through the cavity's porous walls thereby transpirationally cooling the cavity without substantially cooling the surface. The die is immersed in the casting metal where it is quickly solidified in the cool mold cavity. The process is particularly useful for casting low alloy lead battery grids.

3,789,911

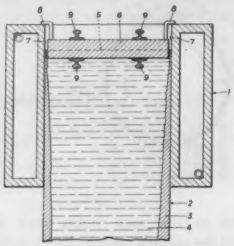
PROCESS FOR CONTINUOUS CONTINUOUS CASTING OF HOT LIQUID METALS

Ernst Bachner, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Nov. 30, 1971, Ser. No. 203,162
Claims priority, application Austria, Dec. 2, 1970, A 10 838
Int. Cl. B22d *23/00*
U.S. Cl. 164—82 **2 Claims**

The disclosure relates to a process for continuous continuous casting in which melts of different chemical compositions are successively cast into a water-cooled mould to form a continuous bar. When casting a melt of one composition is terminated, a metallic body is inserted into the mould so that it

may weld with said melt, and then casting is continued with a melt of another composition which, in turn, welds with said



metallic body. By this process the formation of transitional zones comprising a mixture of melts of different chemical compositions is avoided.

3,789,912

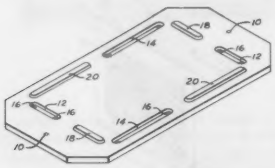
MATCHING PATTERN PLATES

Gerald R. Rusk, Maumee, Ohio, and Robert E. Koch, Ottawa Lake, Mich., assignors to The Freeman Supply Company, Toledo, Ohio

Filed May 30, 1972, Ser. No. 257,930

Int. Cl. B22c *7/04*

U.S. Cl. 164—243 **5 Claims**



Method of producing plates having an identical configuration of valleys and lugs thereon so that one plate is interchangeable with another. Flat plates are provided with a pair of individual holes at opposite ends of the plate center line. Thereafter one or more valleys are machined in a predetermined spacing and location from one or both of the locating holes, and the process repeated for a plurality of plates. Lugs are produced by matching one plate with another by means of pins inserted into the locating holes, and injecting a hardenable material into the valleys. This hardenable material is bonded to the opposite plate. The machining operation of the valleys is carried out in a manner to produce randomly spaced ridges along the side surfaces of the valleys which form depressions in the side surfaces of the lugs that are cast therefrom. Molds made from the respective pattern plates have valleys with ridges therein which have an interference fit with respect to lugs of a matching mold.

3,789,913

STEAM FLOW CONTROL IN CONTINUOUS CASTING MACHINES WITH DIRECT SPRAY WATER COOLING

Wilhelm Stellmacher, Dusseldorf, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

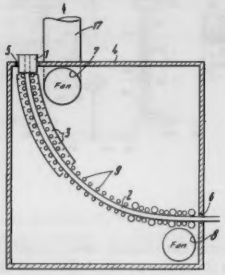
Filed Mar. 27, 1972, Ser. No. 238,188

Claims priority, application Germany, Apr. 5, 1971, P 21 17 621.6

Int. Cl. B22d *11/12*

U.S. Cl. 164—283 **6 Claims**

In a machine for continuous casting, which includes a mold, a water spray cooling system for the casting and an enclosure, provided with a suction fan near the location where the casting enters the enclosure, and a second, lower positioned suc-



tion fan of lower suction power and disposed preferably below the opening in the enclosure through which the casting leaves.

3,789,914

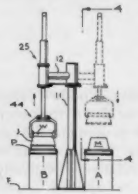
FOUNDRY MOLD JACKET AND WEIGHT SHIFTER

Wilmer J. Friesen, and Frank A. Hulet, both of Hutchinson, Kans., assignors to M. W. Hartmann Manufacturing Co., Inc., Hutchinson, Kans.

Division of Ser. No. 101,363, Dec. 24, 1970, Pat. No. 3,731,822. This application Apr. 24, 1972, Ser. No. 246,904

Int. Cl. B22d *33/04*

U.S. Cl. 164—339 **4 Claims**



The shifting of the jackets and weights from the molds on one conveyor system run to a contiguous conveyor system run is performed automatically by a swinging boom mechanism having a vertical lift mechanism on the outer end of the boom. An open clamp means attached to the lower end of the lift rod closes the clamp on the jacket and accompanying weight of a mold in which the molten metal has solidified. The closed clamp and its load is lifted clear of the mold, swung on the supporting post through an angle to an aligned position over a fresh mold approaching the metal pouring station, after which the jacket and weight, held in the clamp assembly, is lowered over the green mold, set or snugged down on the mold, and the clamp is then opened, raised, swung back over the first conveyor run, and the cycle repeated. The operation is synchronous with the step-by-step movement of the mold pallets on the conveyor.

3,789,915

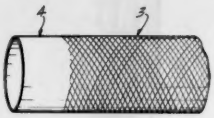
PROCESS FOR IMPROVING HEAT TRANSFER EFFICIENCY AND IMPROVED HEAT TRANSFER SYSTEM

James A. Ford, North Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 822,686, May 7, 1969. This application Apr. 23, 1971, Ser. No. 136,726

Int. Cl. F28f *13/18*

U.S. Cl. 165—1 8 Claims



The instant disclosure teaches a process for improving heat transfer efficiency and an improved heat exchange system utilizing an improved highly corrosion resistant enhanced metal tubing consisting essentially of from 0.5 to 4.0 percent iron, balance essentially copper.

3,789,916

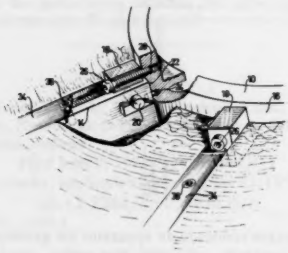
ROTOR FOR EXCHANGERS OF THE THERMODYNAMIC CHARACTERISTICS OF TWO GAS CURRENTS

Sven H. B. Lindahl, Spanga, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed Apr. 6, 1971, Ser. No. 131,735

Int. Cl. F28d *19/04*

U.S. Cl. 165—8 2 Claims



A rotor for exchangers in which the thermodynamic characteristics of two gas currents are transferred from one current to the other while they are being passed through the exchanger insert in zones separated from one another, said rotor being formed with sector spaces defined by the outer surface of an inner hub, an outer envelope and radial spokes interconnecting said hub with said envelope, which sector spaces are filled with a moisture and/or heat transferring insert formed as prefabricated units having the shape of the sector spaces.

3,789,917

ROTARY HEAT-EXCHANGER

Philippe Jarry, Sevres, France, assignor to Le Moteur Moderne, Billancourt, France

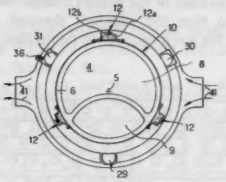
Filed Feb. 14, 1972, Ser. No. 225,753

Claims priority, application France, Feb. 15, 1971, 7104935

Int. Cl. F28d *19/00*

U.S. Cl. 165—8 9 Claims

A rotary heat exchanger of the type having a hot gas pipe, a cold gas pipe and a rotary matrix of a refractory material situated in an interrupted part of the pipes. The matrix has longitudinal passages therethrough capable of establishing communication between said pipes. The active periphery of the matrix is compressed substantially uniformly over its whole width by an elastic peripheral collar which is made up of thin arcuate bands connected by elastic tension members.



3,789,918

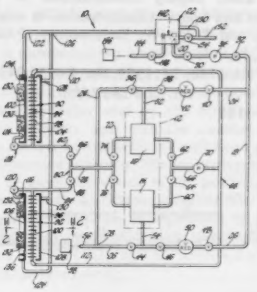
WATER HEATING AND COOLING SYSTEM WITH HUMIDITY CONTROL MEANS

Frank Rogalski, 47900 Harbor Dr., New Baltimore, Mich.

Continuation-in-part of Ser. No. 31,696, April 24, 1970, abandoned. This application Feb. 10, 1972, Ser. No. 225,127

Int. Cl. F24f *3/14*

U.S. Cl. 165—19 3 Claims



A system for heating a particular zone within a related structure, such as a dwelling, includes a water heating boiler and a water reservoir or humidifier sump. The boiler is supplied by the humidifier sump or water reservoir which also reclaims waste water from associated humidifier troughs and drip pans. The drip pans of the system define condensation collecting means for the system. Also included are a plurality of valves to control the heating and humidity, within the zone to be heated, as well as an emergency water supply for the boiler with a circulation pump provided for the heating and/or cooling.

3,789,919

STEAM CONDENSER CONSTRUCTION

Ferdinand V. Huber, Canton, Ohio, assignor to Ecodyne Corporation, Chicago, Ill.

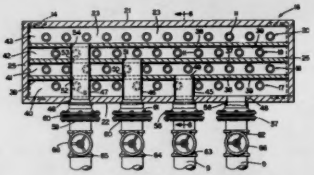
Filed Oct. 18, 1971, Ser. No. 190,087

Int. Cl. F28b *1/06, 1/00*

U.S. Cl. 165—101 8 Claims

An air cooled steam condenser having plates mounted within the condensate outlet header compartment. The plates in effect form a series of subchambers, each of which communicate with a row of cooling tubes in which steam is condensed by a stream of cooling air flowing over, around and past the tubes. The rows of tubes extend transversely of the direction of airflow and the rows extend perpendicular to the direction of airflow at spaced intervals. Tube sleeves extend through a

plurality of openings in the outlet header into the header compartment and terminate, each in a separate subchamber. Valves are connected in condensate lines extending from the tube sleeves externally of the header compartment. The valves are adjusted so that the passages through the valves are smaller in area for each successive connected subchamber in



the header into which the condensate flows so that only that amount of steam that can be condensed effectively within the tubes in any row, enters such row due to the back pressures created by the varying sizes of valve openings, having regard to the length and the temperature difference at the particular row which determines the cooling effect of the airflow over the successive rows of tubes.

3,789,920

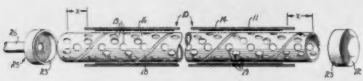
HEAT TRANSFER DEVICE

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration in respect to an invention of, and Ralph W. Kalkbrenner, P.O. Box 10864, Pittsburgh, Pa.

Filed May 21, 1970, Ser. No. 39,343

Int. Cl. F28d *15/00*

U.S. Cl. 165—105 **1 Claim**



A heat transfer device characterized by an hermetically sealed tubular housing including a tubular shell terminating in spaced end plates, and a tubular mesh wick concentrically arranged and operatively supported within said housing. A feature of the invention resides in the provision of an improved wicking restraint formed as an elongated and radially expanded tubular helix concentrically related to the wick and adapted to be axially foreshortened and radially expanded into engagement with the wick in response to an axially applied compressive load, whereby the wick continuously is supported in a contiguous relationship with the internal surfaces of the shell.

3,789,921

DEVICE FOR OFF-CENTERING ABOVE-WATER ARTICULATED MULTIPLE-DRILLING STRUCTURES

Christian DeChassy, Gelos, and Andre Capdeboscq, Jurancon, both of France, assignors to Entreprise De Recherches Et D'Activites Petrolieres (ELF), Paris, France

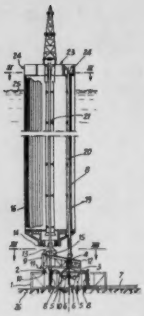
Filed Mar. 1, 1972, Ser. No. 230,918

Claims priority, application France, Mar. 5, 1971, 7107709

Int. Cl. E02b *17/00*; **E21b** *15/02*

U.S. Cl. 166—.5 **9 Claims**

A device for off-centering an above-water articulated drilling structure in relation to a base on the seabed, consisting of a roller-table on the base, surmounted by a vertical pivot-shaft, a circular roller-path, also on the base and concentric with the pivot, an off-centering carriage that can revolve round the pivot, supported by the roller-table and roller-path, and with a guide-ramp along which the lower end of the main



articulation of the structure can slide, and means for rotating the carriage and sliding the articulated structure along the guide-ramp.

3,789,922

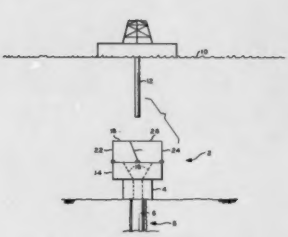
GUIDING AND POSITIONING APPARATUS

Chester L. Knief, Bartlesville, Okla., assignor to Phillips Petroleum Company, Washington, D.C.

Filed Apr. 26, 1972, Ser. No. 247,676

Int. Cl. E21b *33/035*

U.S. Cl. 166—.5 **6 Claims**



This invention resides in an apparatus for guiding and positioning a generally vertically depending element to a preselected location. First and second guiding elements are pivotally attached to an underlying directing element which has sloping inner surfaces. First and second contacting members of the respective guiding elements are maintained above the directing element in an intersecting relationship relative one to the other.

3,789,923

METHOD AND APPARATUS FOR MODIFYING A WELL TO PROVIDE GAS LIFT PRODUCTION

Henry U. Garrett, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

Filed Dec. 17, 1971, Ser. No. 209,128

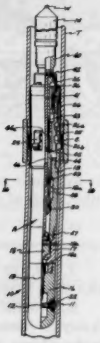
Int. Cl. E21b *43/14*

U.S. Cl. 166—55.1 **13 Claims**

In the method, a perforating device equipped with perforation forming means is lowered through a conventional tubing string and locked with a collar recess at a predetermined subsurface location. On a second trip, a remotely operable actuating device is lowered into engagement with the perforating device and operated to actuate the perforating device which in turn forms perforations through the wall of the surrounding tubing string. On the return leg of the second trip, the per-

forating device is unlocked and removed from the tubing string along with the attached actuating device. On a third trip, a gas lift valve is lowered through the tubing and anchored with the same collar recess to provide regulated valving of fluids flowing through the perforations.

The apparatus includes a perforating device and a separate actuating device. The actuating device is lowered into engagement with the perforating device following locking of the perforating device with a subsurface collar recess. The actuating

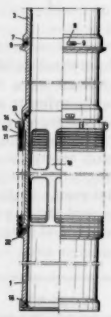


device is surface operated to ignite a charge carried in the perforating device which produces a cutting jet stream to form perforations in the surrounding tubing string. The perforating and actuating devices are locked together for removal as a unit. The apparatus includes a gas lift valve provided with radially movable collar recess anchoring members and axially spaced, self expanding seal members for respectively anchoring the valve with the collar recess and providing a seal above and below the perforations whereby the valve regulates the flow of fluids through the perforations.

3,789,924
FOUNTAIN WELL

Lasse Aaltonen, Nastola; Teuvo Salminen, Lahti, and Voitto Vaisanen, Nastola, all of Finland, assignors to Upo Osakeyhtio, Nastola, Finland

Filed June 9, 1972, Ser. No. 261,451
Claims priority, application Austria, June 17, 1971, 75265
Int. Cl. F28d *15/00;* **E03b** *3/18*
U.S. Cl. 166—105.1 **4 Claims**

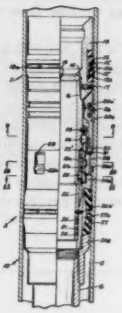


A pipe-formed fountain (bored) well for pumping liquid from a hole in the ground having a pump situated in the sieve section thereof. The sieve section comprises a plurality of ring elements arranged on top of each other. The ring elements are provided with distance elements determining the distance between adjacent ring elements, the distance elements being formed as projections and recesses of stepwise heights and depths, respectively, or as mutually collaborating wedge units so as to allow an arbitrary setting of the ring distance.

3,789,925
ANCHORING ASSEMBLY FOR ANCHORING WELL EQUIPMENT WITHIN A TUBULAR WELL CONDUIT

Cicero C. Brown, Houston, Tex.

Filed Apr. 23, 1971, Ser. No. 136,796
Int. Cl. E21b *23/06, 33/126*
U.S. Cl. 166—125 **22 Claims**

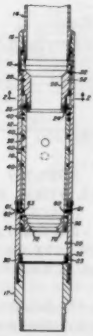


An assembly including a pressure driven positioning member releasably connected with an anchoring member. The assembly is pumped-down a well conduit and the anchoring member is set in anchoring engagement with a collar recess in the conduit where it supports attached well equipment. A resilient annular seal on the positioning member forms a sliding pressure seal with the conduit causing the member to be moved downwardly by well-head pressure and upwardly by formation pressure. The anchoring member is set and retrieved by axial movement of the positioning member which separates from the anchoring member after it is set. The positioning member may be reconnected to release and retrieve the anchoring member and attached well equipment. The positioning member may also be retrieved by a wire-line or tubing string operated device.

3,789,926
TWO STAGE CEMENTING COLLAR

Ronald W. Henley, P.O. Box 638, Waxahachie, Tex., and William D. Taliaferro, 408 Shockley, Desoto, Tex.

Filed Oct. 19, 1972, Ser. No. 298,994
Int. Cl. E21b *33/16, 33/134*
U.S. Cl. 166—224 R **10 Claims**



A cementing collar having a valve sleeve therein releasably held in port closed pre-cementing position until actuated by a

plug device to a port open position maintained by a latching structure until a second plug device actuating a port closing seat disengages the latching structure and moves the valve sleeve into a post-cementing port closed position.

3,789,927

TREATMENT OF GRAVEL PACKED FORMATIONS

Derrel G. Gurley, New Orleans, La., and Curtis W. Crome, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 177,679, Sept. 3, 1971, abandoned. This application Nov. 8, 1972, Ser. No. 304,724

Int. Cl. E21b *43/27*

U.S. Cl. 166—282 **4 Claims**

The treatment of formations, which have been previously packed with gravel, with, for example, an acidizing liquid can be improved by employing as a diverting agent in said treatment fluid particulate diverting agents having a size distribution such that at least about 75 percent of said diverting agent passes through the pack.

3,789,928

PLOUGH BEAM WITH SPRING MECHANISM

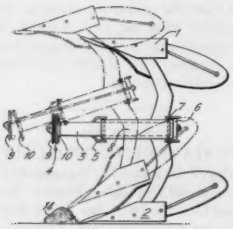
Olav Nja, Kvernaland, Norway, assignor to Kvernelands Fabrikk A/S, Kverneland, Norway

Filed May 19, 1972, Ser. No. 254,964

Claims priority, application Norway, Feb. 1, 1972, 250/72

Int. Cl. A01b *35/24*

U.S. Cl. 172—709 **9 Claims**



A plough beam having a spring mechanism which permits, lateral sidewise motions in addition to motions up and down when encountering an obstacle.

3,789,929

THREE WHEEL ALL WHEEL HYDRAULIC DRIVE TRACTOR

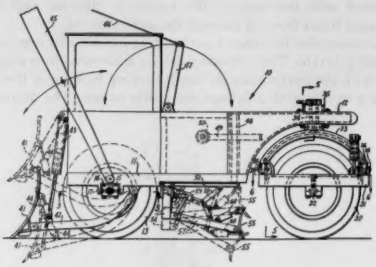
Raymond H. Leidig, Rt. 3 Box 504, Lake Charles, La.

Filed Mar. 29, 1972, Ser. No. 239,119

Int. Cl. E02f *3/12*

U.S. Cl. 172—798 **2 Claims**

A three wheel all wheel hydraulic drive tractor in which the single wheel is steerable and all wheels tilt about a longitudinal axis for maintaining the stability of the tractor. A bulldozer blade and a grader blade are each fixed to the tractor for vertical and tilting adjustment as well as transverse tilting adjustment. All adjustments are hydraulically made and an internal combustion engine drives a hydraulic pump to power the adjusting cylinders and the hydraulic power motors. The power motors are mounted within each of the wheels within the rim thereof.



3,789,930

METHOD FOR REDUCING NOISE OF A DIESEL PILE HAMMER

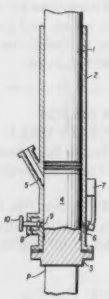
Shojiro Nishimura, Ashiya; Masao Ishizaki, Kakogawa; Yoshiro Seo, and Shinobu Akima, both of Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Jan. 19, 1972, Ser. No. 219,008

Claims priority, application Japan, Jan. 21, 1971, 46/2045

Int. Cl. E02d *7/12*

U.S. Cl. 173—1 **6 Claims**



A method and apparatus for reducing noise of a diesel pile hammer characterized by controlling the effective volume of a combustion chamber defined by a diesel cylinder, a ram reciprocably received in the cylinder and an anvil forming an end face of the cylinder in a manner that the combustion of the fuel-air mixture is always begun just before the ram comes into contact with the anvil, regardless of the operating condition of the pile hammer, atmospheric temperature and/or pressure, the kind of fuel used, or other conditions, whereby noise due to the mechanical striking of the ram against the anvil is nullified and a substantial reduction of noise is thereby accomplished.

3,789,931

TRACTOR MOUNTED HYDRAULIC POSTHOLE DIGGER

Gerald L. Quinn, Rt. 7, Burwell, Nebr.

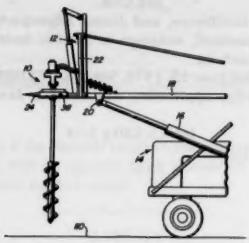
Continuation-in-part of Ser. No. 60,577, Aug. 3, 1970, abandoned. This application Jan. 26, 1972, Ser. No. 220,862

Int. Cl. E21c *11/02*

U.S. Cl. 173—22 **4 Claims**

An attachment selectively mountable on different loader heads of farm and construction equipment and including a

readily detachable hydraulic motor for actuation by the central hydraulic system of the loader whereby the same hydraulic motor may be utilized to power other attachments. The attachment includes a cradle for supporting a motorized auger in pendulum-like fashion so that true vertical disposition of



the auger may be obtained. When the motor is energized and the supporting portion of the loader is lowered relative to the ground with which the auger is engaged, a substantially true vertical hole is bored in the ground. Further, the hydraulic motor is reversible whereby after a hole has been bored removal of the auger is facilitated.

3,789,932

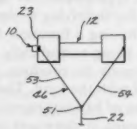
VIBRO HAMMER POSITIONER

Davis W. Giroux, No. 3 Lakewood, Council Bluffs, Iowa

Filed June 7, 1972, Ser. No. 260,418

Int. Cl. E02d *7/06*

U.S. Cl. 173—43 **6 Claims**



A positioner is disclosed herein for use on a vibrating hammer or vibro hammer. The vibro hammer is normally supported by a hoist line extending from a conventional crane. The positioner is secured to one end of the hammer and comprises a vertically disposed hydraulic cylinder means enclosed in a vertically disposed protective housing. The hydraulic cylinder has a first pulley secured to its upper base end and second and third pulleys secured to its rod end. A first cable member is fixedly secured at one end thereof to the upper end protective housing and extends around the second pulley, thence around the first pulley, thence around the third pulley and thence outwardly from the housing. The first cable member is connected at its other end to the other end of the hammer. The first cable member is connected between its ends, thereby defining first and second cable portions, to a standard Rud-O-Matic (TM) tagline extending from the crane. The hammer may be selectively rotated about the axis defined by the hoist line by activating the hydraulic cylinder which effectively increases or decreases the length of the first cable portion of the first cable member.

3,789,933

HAMMER DRILL

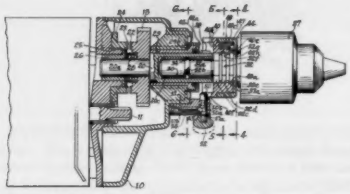
John S. Jarecki, Villa Park, Ill., assignor to Skil Corporation, Chicago, Ill.

Filed Aug. 30, 1972, Ser. No. 284,738

Int. Cl. B25d *11/00*, *15/00*

U.S. Cl. 173—48 **14 Claims**

A shaft is driven by the motor of the power tool. This shaft carries a ring gear having an annular formation of teeth adapted for ratcheting engagement with an annular series of fixed teeth. When the shaft is moved inwardly of the tool housing as a result of contact of the drill bit with the work, these teeth are brought into engagement to provide a hammering action. A spindle carries the drill chuck at one of its ends; the other end of the spindle is rotatably received within a bore formed in one end of the shaft. The shaft has an external hex-



agonal formation at said one end thereof. The spindle has external hexagonal formations intermediate its ends. A sleeve has an internal hexagonal formation engageable with selected ones of said external formations for coupling and uncoupling the spindle and the shaft; a locking collar is mounted on the sleeve for positively locating the latter in any one of three axial positions to provide a hammering action only, a drilling action only and a combined drilling and hammering action.

3,789,934

ROTARY IMPACT MOTOR

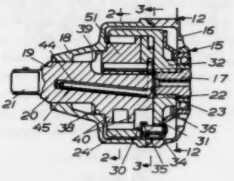
Knut Christian Schoeps, and Karl Gosta Karden, both of Nacka, Sweden, assignors to Atlas Capco Aktiebolag, Nacka, Sweden

Filed Mar. 31, 1972, Ser. No. 239,881

Claims priority, application Sweden, Apr. 7, 1971, 4515/71

Int. Cl. B25d *15/02*

U.S. Cl. 173—93.5 **14 Claims**



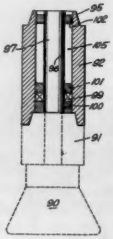
In a rotary impact motor for power driven fastener setting tools, an impact dog is pivotally journalled on a rotatable anvil about an axis spaced from the axis of rotation of the anvil. A hammer is rotatable around the impact dog and anvil. Cooperating cam means mounted respectively on the hammer and on the impact dog are responsive to relative rotation therebetween for pivoting out the impact dog from the anvil to be impacted by the hammer.

3,789,935

ANGULAR ACCELEROMETER

Fuad T. Saadeh, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 859,768, Sept. 22, 1969, Pat. No. 3,693,460. This application Oct. 19, 1971, Ser. No. 190,639
Int. Cl. G01p *15/00*
U.S. Cl. 175—40 3 Claims



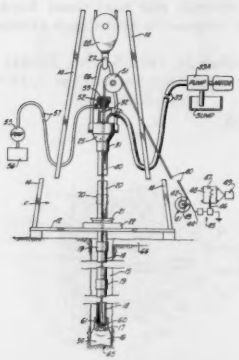
An angular accelerometer which employs an annular conduit filled with a dielectric fluid. The conduit is blocked at at least one point and there are piezoresponsive elements mounted so as to have the fluid directly apply pressure thereto. The elements are mounted adjacent to the blocked portion of the conduit, one on either side thereof. The structure is adapted for use with a drilling bit in order to indicate eccentricities during drilling as well as to measure instantaneous angular acceleration.

3,789,936

METHOD AND APPARATUS FOR SIMULTANEOUSLY DRILLING AND LOGGING

Ira J. McCullough, 10845 Sunset Blvd., Los Angeles, Calif.

Continuation-in-part of Ser. No. 854,506, Sept. 2, 1960, abandoned. This application Nov. 4, 1971, Ser. No. 195,639
Int. Cl. E21b *49/00*
U.S. Cl. 175—50 16 Claims



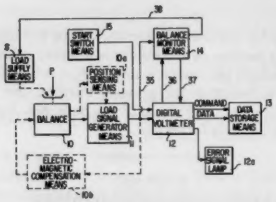
Method and apparatus for simultaneously drilling and logging a bore hole employing an electric cable extending through a drill string which has a swivel at the top end and a bit secured to its lower end. The electric cable communicates with a detecting probe which is disposed adjacent the bit. This provides a continuous circuit from the formation at the bottom of the well to the surface recording instruments at the top of the well. During the simultaneous drilling and logging operations the drill string and bit rotate while the surveying cable remains non-rotative. The swivel, drill string, cable and probe are lowered together during the simultaneous drilling and logging operation.

3,789,937

ELECTRICAL BALANCE INCLUDING MONITORING MEANS

Felix Strobel, Greifensee, and Heinz Allenspach, Fallenden, both of Switzerland, assignors to Mettler Instrumente AG, Zurich, Switzerland

Filed June 25, 1973, Ser. No. 373,003
Claims priority, application Switzerland, June 27, 1972, 9601/72
Int. Cl. G01g *3/14*
U.S. Cl. 177—210 12 Claims



An improved electrical balance is disclosed of the type including stationary and load-responsive movable components, means being provided for supplying to signal evaluating means an analog load signal having a function that varies with load, said evaluation means being periodically operable during successive measuring periods to produce digitalized measurements that correspond with the load. The invention is characterized by the provision of balance monitoring means that disable the evaluation means in the event that movement of the movable balance component exceeds predetermined limits during the measurement period. The monitoring means further effects the transfer of each digitalized measurement result to associated data storage means only when the movement of the movable component has not exceeded the predetermined limits during the corresponding measurement period. In balances including load compensation means, the load signal may be the compensation current that is supplied to the compensation coil means.

ERRATUM

For Class 179—81 R see:
Patent No. 3,789,803

3,789,938

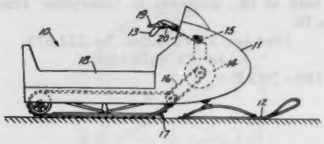
AUTOMATIC SHUT-OFF SWITCH

Edgar E. Hetteen, Thief River Falls, Minn., assignor to Artic Enterprises, Inc., Thief River Falls, Minn.

Filed Apr. 24, 1972, Ser. No. 247,097
Int. Cl. B60k *33/00*
U.S. Cl. 180—5 R 10 Claims

An automatic shut-off switch system for the ignition circuit of vehicles such as snowmobiles is provided wherein the ignition circuit includes a first switch, adjacent the carburetor throttle and in operative engagement therewith, which first switch is normally closed when the engine is at idle speeds and open when the engine is at running speed and a second switch electrically parallel to said first switch and operatively joined to the manually operated throttle control means remote from

said throttle. The second switch is open at engine idle speeds and closed by the manual throttle control during running



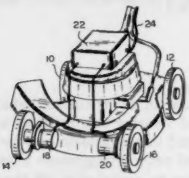
speeds so that if the throttle sticks in the open position the ignition circuit will be opened upon release of the manually operated throttle control means.

3,789,939

APPARATUS FOR PROGRAMMING MOVEMENT OF A CART

Eric L. Geislinger, 13773 S.W. Electric St., Beaverton, Oreg.

Filed Sept. 7, 1971, Ser. No. 178,116
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.5 **3 Claims**



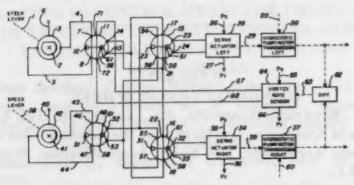
A wheeled cart is controlled to take a particular path under the direction of movement information stored on a tape recorder. The information on the tape recorder is initially placed there as the cart is manually directed over the desired path with a control means. The prescribed path for the cart can be altered at any time by changing the recorded information in the same manner as initially provided.

3,789,940

SYNCHRONIZED STEERING CONTROL SYSTEM

Robert V. Burton, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 7, 1972, Ser. No. 223,897
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.48 **8 Claims**



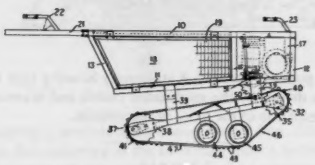
A fluidic steering control system having at least two propelling means, one for each side of the vehicle, a separate variable speed transmission for driving each of the propelling means, a separate fluidic circuit for driving each of the transmission means, a common steering transducer for controlling the relative outputs of the amplifying means, and feedback means for providing a feedback dependent upon the relative speeds of the transmissions.

3,789,941

TRANSPORTERS

Roderick Robertson, Ross, Scotland, assignor to George Robertson; Kenneth Robertson; Roderick Robinson and William Berkeley, all of Tain, Ross-shire, Scotland

Filed Mar. 29, 1971, Ser. No. 128,762
Int. Cl. B62d *55/00*
U.S. Cl. 180—9.22 **10 Claims**



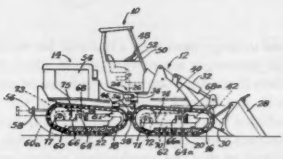
The invention is concerned with a pedestrian-controlled transporter. The transporter is arranged to traverse the ground on a motor-driven endless track upon which a load-carrying structure is supported, the transporter being controlled by the pedestrian through suitable located manual controls.

3,789,942

CLOSE COUPLED FRAME STEERED ALL CRAWLER TRACTOR

John J. Kowalik, Glenview, Ill., assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 65,826, Aug. 21, 1970, Pat. No. 3,741,331.
This application Aug. 18, 1972, Ser. No. 281,882
Int. Cl. B62d *11/00*
U.S. Cl. 180—9.44 **9 Claims**



Frame-steered, all crawler tractor having articulated frame sections end-to-end, and crawler tracks provided on one section which can be retracted from those confronting crawler tracks in tandem therewith which are provided on the other section. In driving the tractor into a turn I thus afford a retractive endless track, say a rear track which, as I make the turn, takes the inside of the turn, but at all times keeps its distance from the front track at the inside of the turn.

There is no interference because the retractive track, in the case of the rear track for instance, does not try to climb up on the front track, and the resulting close-coupled articulated vehicle is not train-like in length.

3,789,943

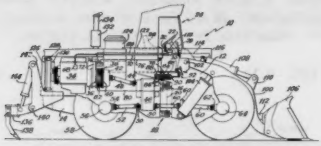
VEHICLE DRIVE AND POWER CONTROL MEANS

Keith W. Kampert, Libertyville, and Kenneth E. Houtz, Streamwood, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Oct. 12, 1971, Ser. No. 188,062
Int. Cl. B60k *17/02*
U.S. Cl. 180—66 R **1 Claim**

An articulated loader having an operator's compartment on the front section and an engine on the rear section connected to drive both a pump means and a modulated clutch, has a valve for varying the pressure in the modulated clutch in order

to determine the speed of the vehicle and a foot pedal in the operator's compartment connected to the valve for con-



trolling the position thereof. A stationary housing type torque convertor is driven by the modulated clutch and is connected to drive at least one of the axles of the vehicle.

3,789,944

MOTOR VEHICLE FRONT END CONSTRUCTION

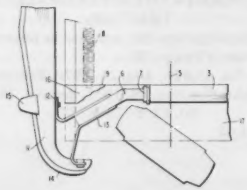
Bela Barenyi, Maichingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Sept. 2, 1971, Ser. No. 177,365

Claims priority, application Germany, Sept. 2, 1970, 2043524

Int. Cl. B60r *19/06*

U.S. Cl. 180—68 P **35 Claims**



A front end arrangement with a radiator for motor vehicles, especially for passenger motor vehicles, in which longitudinal support girders that adjoin the form-rigid passenger center cell of the vehicle, are forked within the area of the axle planes while the radiator is arranged at mountings adjacent to and/or above the impact yielding areas of angular bends in the longitudinal girders so that the longitudinal girders possess a longitudinal yieldingness and the radiator and engine units are damaged only after the normal range of penetration of the bumper is overcome.

3,789,945

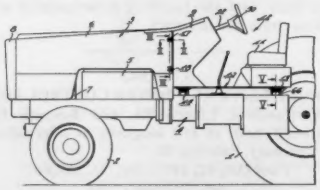
VEHICLE CONTROL MODULE SUPPORT

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 4, 1971, Ser. No. 195,641

Int. Cl. B62d *25/10*

U.S. Cl. 180—69 R **10 Claims**



A supporting arrangement including a firewall for supporting the control levers and instrument panel and a resilient joint connecting the rear end of the engine hood and side panel with the firewall.

3,789,946

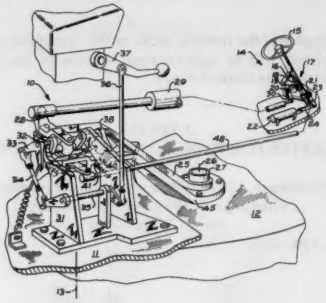
DUAL STEERING SYSTEM FOR ARTICULATED VEHICLES

Stanley A. Jorgensen, Oswego, and Stanley B. Adams, Yorkville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 31, 1972, Ser. No. 222,073

Int. Cl. B62d *5/06*

U.S. Cl. 180—79.2 B **5 Claims**



A steering system for an articulated vehicle having a central vertical pivot and steering axis includes a follow up linkage pivotally connected to a follow-up arm for follow up steering of the vehicle, and neutralizing means to render the follow-up linkage insensitive to articulation of the vehicle for direct steering of the vehicle. The neutralizing means includes means pivotally mounting the follow-up arm on the vehicle frame, and linkage means operable to pivot the follow-up arm to a configuration wherein the pivotal connection of the follow-up arm to the follow-up linkage is disposed on the vehicle pivot axis.

Articulation limit means is also provided to limit articulation of the vehicle when in the direct steering mode comprising a control arm attached to one frame of the vehicle and intersecting the vehicle pivot axis, and a lever having one end pivotally connected to the control arm at the vehicle pivot axis and a second end connected by a control link to the vehicle steering gear. Adjustable set screws on the control arm limit pivoting of the control arm with respect to the lever, whereby upon the control arm reaching the limit of rotation with respect to the lever, the steering gear will be actuated to stop further articulation of the vehicle.

3,789,947

OMNIDIRECTIONAL WHEEL

Josef F. Blumrich, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

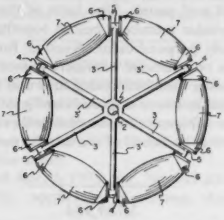
Filed Apr. 17, 1972, Ser. No. 244,519

Int. Cl. B62d *5/02*

U.S. Cl. 180—79.3 **5 Claims**

The apparatus of the invention consists of a wheel having a hub with radially disposed spokes which are provided with a plurality of circumferential rim segments. These rim segments carry, between the spokes, rim elements which are rigid relative to their outer support surfaces, and defined in their outer contour to form a part of the circle forming the wheel diameter. The rim segments have provided for each of the rim ele-

ments an independent drive means selectively operable when the element is in ground contact to rotatably drive the rim element in a direction of movement perpendicularly lateral to the normal plane of rotation and movement of the wheel. This affords the wheel omnidirectional movement.



3,789,948

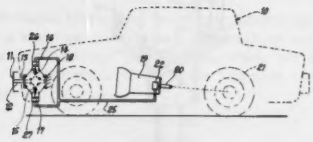
MOTOR SPEED ACTUATED VEHICLE BUMPER

James Hrebicek, 2327 S. 61st Ave., Cicero, Ill.

Filed Jan. 6, 1971, Ser. No. 104,441

Int. Cl. B60r *19/06;* **B61f** *19/04;* **F16f** *13/00*

U.S. Cl. 180—91 **1 Claim**



A motor actuated shock absorbing bumper has an improvement upon a variable rate spring used to absorb the energy of a collision, the improvement comprising a rate control for the spring, and means operated as a function of the speed of the vehicle for controlling the setting of the rate control such that the higher the speed at which a collision occurs, the stiffer the spring becomes. In its preferred form, the rate control comprises a piston, and the speed control comprises a variable pressure pump driven from the vehicle transmission output shaft and supplying liquid to the piston at a pressure which increases with the speed of the output shaft.

3,789,949

CERTAIN NEW AND USEFUL IMPROVEMENTS IN OR RELATING TO CONTROL MEANS FOR THE RELEASE OF SAFETY APPLIANCES IN VEHICLES, MORE PARTICULARLY PASSENGER CARRYING AUTOMOBILES

Manfred Bortfeld, Eching; Werner Wintershoff, and Rainer Anton, both of Munich, all of Germany, assignors to Bayerische Motoren Werke A.G., Munich, Germany

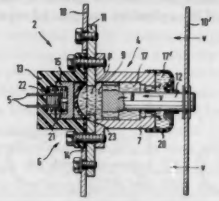
Filed July 14, 1972, Ser. No. 271,875

Claims priority, application Germany, July 16, 1971, 2135550

Int. Cl. B60r *21/00*

U.S. Cl. 180—91 **1 Claim**

Control means for the release of safety appliances for the protection of passengers in motor vehicles comprising a hydraulic activating part and a receiving part co-operating therewith and adapted to operate release means for the safety appliance and secured to a part of the vehicle, said activating part consisting essentially in a casing filled with hydraulic fluid, a piston arranged for axial movement in said casing and adapted to be displaced with a velocity proportional to the degree of deformation to which the vehicle has been subjected, whereby the liquid pressure set up by throttling means on reaching a predetermined minimum value, determined by suitable dimensioning of the throttling means, activates via the receiving part release means for the safety appliance.



3,789,950

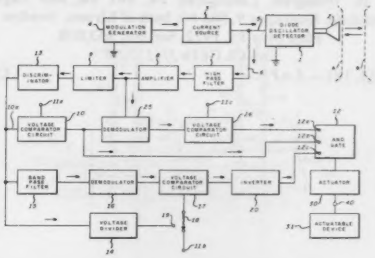
VEHICLE PROTECTIVE APPARATUS

Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 8, 1972, Ser. No. 232,814

Int. Cl. B60k *27/00*

U.S. Cl. 180—98 **7 Claims**



A vehicular protective apparatus includes radio means for detection of an impending collision immediately prior to actual contact of a protected vehicle with another vehicle or other object and for the actuation of restraining or other protective devices for the protection of the occupants of the vehicle when the crash actually occurs. Modulated single-port continuous wave, high frequency transmitter-receiver apparatus is employed for processing reflected object signals; obstacle presence, closing differential speed, and minimum range signals are generated. All must be present for actuation of passenger restraints or other protective devices.

3,789,951

VIBRATOR SYSTEM FOR GENERATING SEISMIC WAVES IN THE EARTH

Daniel Silverman, 5969 S. Birmingham, Tulsa, Okla.

Filed Feb. 7, 1972, Ser. No. 223,896

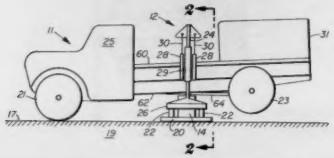
Int. Cl. G01v *1/02*

U.S. Cl. 181—.5 VM **24 Claims**

This invention describes a vehicle-mounted electrohydraulic vibrator system useful for generating seismic waves in th earth. It comprises a baseplate supported from the vehicle by downwardly extending means and attached to the baseplate through compliances.

The vibrator system comprises four hydraulic cylinders and pistons operatively mounted in the cylinders. The pistons are attached to the baseplate through a first frame and are supported thereby. The cylinders are connected to a second frame placed above and resting on the vibrator. The second

frame is adapted to support a mass. The mass can be a separate discrete mass of metal, or alternatively, the second frame can be clamped to the bed of the vehicle, in which case the vehicle becomes the reaction mass. If the vehicle has a drive shaft, two of the cylinders are placed on each side of the drive shaft.



The pistons in the cylinders are single-acting. That is, a first piston in a first cylinder is pushed downwardly and a second piston in a second cylinder is pushed upwardly with respect to the cylinders when pressure fluid is introduced into the cylinders. The four single-acting vibrators arranged in rectangular spacing provide an alternating vertical force acting at the center of the rectangle.

3,789,952

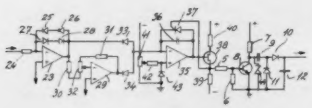
NOISE DOSIMETER

Lars H. Widegren, Larargatan 14, 981 00, and Tage O. Keskitalo, Knavagen 9, 981 00, both of Kiruna, Sweden

Filed May 15, 1972, Ser. No. 253,038

Int. Cl. G01h *3/12, 1/08*

U.S. Cl. 181—.5 AP **1 Claim**



A noise dosimeter having noise pick-up means for generating an analog signal in correspondence to picked-up noise, signal processing means for generating pulses in correspondence to the analog signal, and means for adding and storing the pulses.

3,789,953

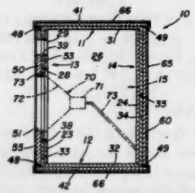
SOUND REPRODUCTION SYSTEM

Scott F. Everitt, Indianapolis, Ind., assignor to Accoustic Fiber Sound Systems, Inc., Indianapolis, Ind.

Filed Jan. 31, 1972, Ser. No. 222,262

Int. Cl. G10k *13/00;* **H04r** *1/28*

U.S. Cl. 181—31 B **5 Claims**



A plurality of generally tubular members of corrugated fiberboard, each rectangular in transverse cross-section and including four panels, are nested one within the other to form a closed six-walled housing, each wall comprising back-to-back panels secured together with the corrugations thereof extending in mutually perpendicular directions, each tubular member being formed of a continuous sheet of fiberboard folded to the tubular configuration and having opposite side edges thereof joined together to form a seam disposed centrally of one of said panels. One form of the invention comprises three tubular members nested together with the axes thereof mutually perpendicular. Another form of the invention comprises two tubular members nested together coaxially, with the inner member having four end flaps at each end thereof disposed in use in a folded configuration wherein opposed flaps are coplanar and joined together to form back-to-back end panels at each end of the tubular member for closing same.

3,789,954

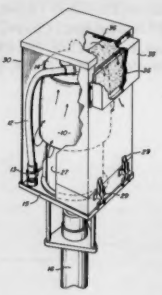
AIR MOTOR NOISE SUPPRESSOR

Walter J. Raleigh, St. Paul, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed June 19, 1973, Ser. No. 371,433

Int. Cl. F01m *3/06;* **F04b** *21/00*

U.S. Cl. 181—33 K **10 Claims**



Self-contained apparatus is described for reducing the acoustic and mechanical noise associated with an air-operated motor, wherein noise signals are contained within a sealed enclosure surrounding the air motor and channeled over a complex path including noise filters to the atmosphere.

3,789,955

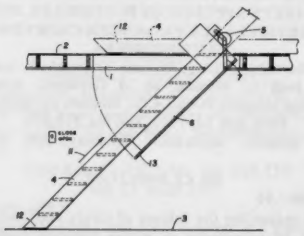
RETRACTABLE STAIRWAY DEVICE

William H. Knapp, Selma, Ala., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Aug. 18, 1972, Ser. No. 281,735

Int. Cl. E06c *9/00*

U.S. Cl. 182—78 **3 Claims**



A motor is mounted in an upper floor adjacent an opening between the upper floor and an adjacent lower floor of a structure. A coupling device is provided in a stair unit and the motor so that in one manner of operation the motor retracts

the stair unit upward onto the upper floor through the opening and closes the stair unit substantially flush with the upper floor. In another manner of operation, the motor opens the stair unit downward from the upper floor and extends the stair unit downward onto the lower floor through the opening.

3,789,956

HYDROSTATIC LUBRICATING DEVICE FOR THE MESHES OF CYLINDER WORMS AND A WORM RACK

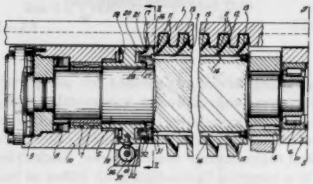
Heinz Neugebauer, Weidach near Coburg, Germany, assignor to Werkzeugmaschinenfabrik Adolf Waldrich Coburg, Coburg/Bay., Germany

Filed Apr. 3, 1972, Ser. No. 240,526

Claims priority, application Germany, Apr. 14, 1971, 2118033

Int. Cl. F01m *1/00;* **F16n** *17/06*

U.S. Cl. 184—6.12 **9 Claims**



A hydrostatic lubricating device for lubricating the teeth between a worm and a worm rack. The teeth are supplied with pressurized oil through passageways which are distributed over the circumference of the worm and open outwardly at the flanks.

3,789,957

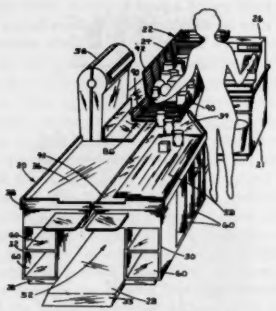
CHECK OUT SYSTEM

James Garth Close, Box 3096, Lubbock, Tex.

Filed Apr. 5, 1972, Ser. No. 241,279

Int. Cl. E04h *3/04*

U.S. Cl. 186—1 AC **20 Claims**



A check out system for a supermarket, or other retail merchandise store or the like, having a cooperating shopping cart and check out counter. The check out counter is provided with a horizontal check out surface which is elevated above the floor at a convenient work height. This surface can support apparatus such as scales, or be provided with conveyors in the surface thereof for moving merchandise. The check out surface is also provided with a centrally located groove which extends along the length thereof, the groove being narrow enough in width so that ordinary merchandise will not fall therein. Located below the groove is a clearance area which extends the length of the check out counter. This area has an inclined ramp surface for supporting a check out cart therein. A check out cart is provided with an undercarriage portion having a plurality of rotatable wheels thereon for allowing the cart to move over the surface of the store or supermarket, as required. Also attached to the undercarriage is an auxiliary merchandise receiving portion and a narrow upstanding support to which is pivotably attached an upper basket portion for receiving merchandise and the like. The merchandise cart is provided with a foldable infant seat assembly for use in transporting infants about the store. The carts are also provided with means for allowing the carts to nest together to reduce the storage space required therefor. The upstanding support on the cart is such a size that it will slide through the groove with the undercarriage portion moving through the clearance area and the upper basket portion being supported above the upper surface of the counter. Also, the upper basket portion is provided with a vertically swinging door in the side thereof which allows easy access to the interior of the basket portion.

3,789,958

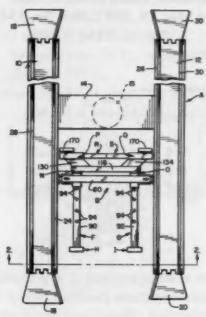
VEHICLE SUPPORT

Theodore J. Masaitis, Fairview Park, Ohio, assignor to Wyle Laboratories, El Segundo, Calif.

Filed Oct. 2, 1972, Ser. No. 294,094

Int. Cl. B60s *13/00*

U.S. Cl. 187—8.49 **19 Claims**



An auxiliary vehicle support for use with a drive-on type of vehicle hoist selectively supports the vehicle from its undercarriage with its tires above the hoist tracks. The auxiliary vehicle support is swingable between a substantially vertical supporting position and a substantially horizontal storage position.

3,789,959

APPARATUS FOR AUTOMATIC PAD ADJUSTMENT IN DISK BRAKES

Takeski Kawaguchi, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1972, Ser. No. 284,458

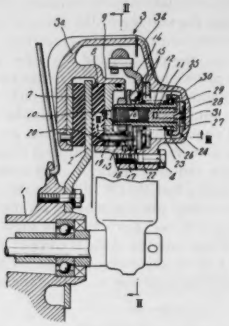
Claims priority, application Japan, Aug. 28, 1971, 46-65567

Int. Cl. F16d *65/56*

U.S. Cl. 188—71.9 **8 Claims**

A disk brake of the type in which a caliper member extends over a brake disk and is provided, on opposite inner surfaces, with a stationary pad and a movable pad, the latter being arranged to be advanced by being pushed upon pivoting of an operation lever. An automatic pad adjustment apparatus is provided for compensation of wear of the pads and the movable pad is so arranged as to be pushed by the operation lever

through a threaded tube which is in threaded engagement with an adjusting screw secured to the rear face of the pad. A



return spring is connected at one end to the operation lever and at its other end to the adjusting screw through a one-way clutch.

3,789,960

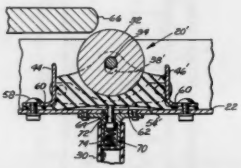
ROLLER BRAKE SYSTEM

Robert A. Warren, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed May 18, 1972, Ser. No. 254,495

Int. Cl. F16d *63/00*

U.S. Cl. 188—74 **3 Claims**



A roller brake system including a plurality of rollers each having an associated friction member which is moved into engagement by controlled pressurized medium applied to a side of the friction member opposite the roller.

3,789,961

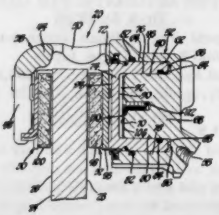
MULTIPLE CHAMBER DISC BRAKE CALIPER ASSEMBLY

Edward H. Warwick, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 22, 1972, Ser. No. 255,687

Int. Cl. B60t *11/16, 11/30*

U.S. Cl. 188—345 **8 Claims**



The invention relates to a wheel brake for an automotive vehicle and, more particularly, to the caliper assembly provided as a part of a disc brake. The invention is further related to a brake wheel cylinder assembly for use in a disc brake assembly or other types of brakes requiring multiple chamber wheel cylinder actuation.

3,789,962

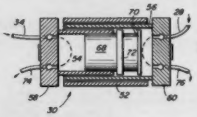
HYDRAULIC ACTUATOR FOR DUAL BRAKING SYSTEM

Emmanuel Frangiudakis, Athens, Greece, assignor to John W. Frangos, Beverly, Mass.

Filed May 25, 1972, Ser. No. 256,877

Int. Cl. B60t *11/10*

U.S. Cl. 188—345 **4 Claims**



An actuating device is provided for use particularly with braking systems especially for automobiles, trucks and the like. The hydraulic actuator includes a pair of telescopic tubular cylinders having a common movable piston valve mounted for limited reciprocation therebetween. Each cylinder is connected to a separate hydraulic circuit either or both of which when pressurized will cause the cylinders to spread apart so as to actuate the braking mechanism. The device will actuate irrespective of failure of one of the hydraulic lines.

3,789,963

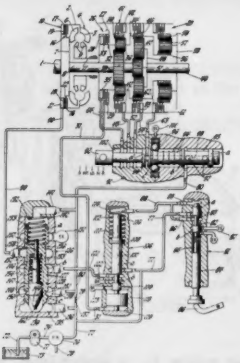
TRANSMISSION CONTROL SYSTEM

Keith A. Bailey, Speedway, and Jerry R. Marlow, Greenwood, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 21,950, March 23, 1970, Pat. No. 3,682,043. This application June 5, 1972, Ser. No. 259,465

Int. Cl. B60k *21/00*

U.S. Cl. 192—3.57 **9 Claims**



A transmission having a torque converter with a lockup clutch and a multi-ratio gear unit having fluid motors to establish the ratio drives. The controls have a shift system including a shift valve selectively supplying each fluid motor with leakage make-up flow to maintain a ratio established and shift flow to establish another ratio, a lockup clutch valve to engage the lockup clutch and a flow valve tripped by a fast change in flow rate on initiating shift flow to disengage the lockup clutch and permitting slow changes in the leakage flow

rate without tripping. These flows pass through a restriction providing a differential pressure which selectively actuates the trip control and the response control of the flow valve. The slowly increasing leakage flow rate actuates the response control which increases the size of the restriction or the return biasing force to permit slowly increased leakage flow without actuating the tripping control to trip the flow valve. The response control is unresponsive to the rapid increase of the shift flow rate which only actuates the tripping control to trip the flow valve.

3,789,964

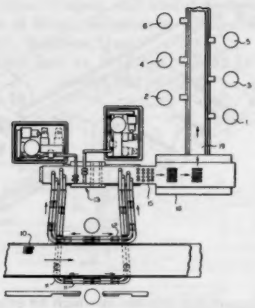
APPARATUS FOR SUPPLYING SLUGS OF COOKIES IN PRESELECTED SIDE-BY-SIDE GROUPS FOR BAGGING

Richard C. Talbot; Edward Rose, both of Skokie, and Robert A. Roth, Chicago, all of Ill., assignors to Peters Machinery Company, Chicago, Ill.

Division of Ser. No. 173,473, Aug. 20, 1971, Pat. No. 3,719,020. This application Nov. 30, 1972, Ser. No. 310,970

Int. Cl. F16d *71/00;* **F16h** *35/06*

U.S. Cl. 192—29 **12 Claims**



Phase selector and reduction drive mechanism, for effecting operation of a member in phase relation with respect to at least one other member. The phase selector includes a drive shaft, a driven shaft forming a drive member for the one other member, a disk freely mounted on the driven shaft and carrying two idler sprockets freely rotatable about axes parallel to the axis of rotation of the driven shaft and a drive sprocket on the driven shaft. An endless chain on the drive shaft is trained from the sprocket on the drive shaft along the periphery of the disk about one idler sprocket and inwardly therefrom about the drive sprocket on the driven shaft and outwardly from said drive sprocket to and about the second idler sprocket and about the periphery of the disk to the sprocket on the drive shaft. The disk forms an angular adjustment means for adjusting the phase of the driven shaft and members driven therefrom and is adjustably moved about the axis of the driven shaft by a crank and threaded shaft which also serves to hold the disk from rotation. The crank and threaded shaft are thus operable to adjustably move the disk to conform the phase relation of the drive to the at least one other member, in accordance with the changes in speed of travel of the drive shaft.

3,789,965

VACUUM CLUTCH ACTUATOR

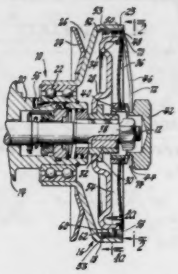
John H. Heidorn, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 21, 1972, Ser. No. 264,882

Int. Cl. F16d *25/00*

U.S. Cl. 192—85 V **3 Claims**

A vacuum clutch actuating mechanism including a member responsive to vacuum encircling a driven shaft and defining a closed space. One wall of the member is flexible and moves in response to vacuum supplied to the closed space. A leaf spring is attached to the moving wall and extends radially outwardly to engage a driven member mounted for radially outward movement and engage a driving member when the vacuum is supplied to the closed space moving the flexible wall. A two way overrunning clutch can be provided between the outer periphery of the driven member and an inwardly facing peripheral surface of the driving member. The radially outward movement of the spring is sufficient to initially lock up the overrunning clutch when the flexible wall moves in response to vacuum.



3,789,966

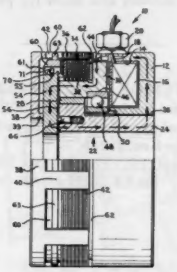
SELF-ADJUSTING ELECTROMAGNETIC DISC CLUTCH

Donald L. Miller, Horseheads, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 31, 1971, Ser. No. 129,740

Int. Cl. F16d *13/60*

U.S. Cl. 192—111 A **6 Claims**



An electromagnetic clutch with wear compensating means having two sets of co-acting friction discs adapted for releasably coupling a driving and driven rotary component. When the clutch is energized, the armature, which is not in the drive train, contactively engages with the pole faces of the electromagnet causing the freely mounted armature to rotate with the driving member; an adjusting ring which is slidably splined to the driven rotary component and advanceably threaded to the armature for relative rotation therewith, thereby applies the necessary engagement pressure to the friction disc assembly causing torque to be transmitted from the driving to the driven rotary component through the disc assembly. Any lost motion occasioned by wear of the friction discs is automatically taken up by the screw-action of the adjusting ring upon the armature; thus, the desired disc engagement pressure and the electromagnetic engaging force are held constant for the life of the clutch.

3,789,967

CLUTCH ASSEMBLY FOR A VEHICLE

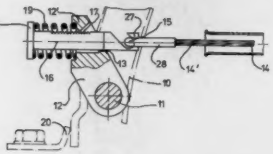
Wolfram Dau; Paul Langer, and Hans Gritzan, all of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg

Filed Dec. 1, 1972, Ser. No. 311,103

Claims priority, application Germany, Dec. 4, 1971, P 21 60 278.8

Int. Cl. F16d *13/75*

U.S. Cl. 192—111 A 15 Claims



An interlocking device for a clutch that utilizes an actuating mechanism containing a clutch cable and clutch pedal, the interlocking device being designed to automatically adjust the actuating mechanism for friction lining wear and cable elongation, when the clutch pedal is in its rest position. The interlocking device includes a gripping member which is coupled to the clutch pedal and which is adapted to be pivoted about an axis when the pedal is depressed to disengage the clutch. The gripping member has an opening formed therein in which a spring-mounted pin rides. This pin, which is coupled to the pedal end of the clutch cable, enjoys a certain degree of play in the opening when the clutch pedal is at its rest position, so that it will automatically be moved, under the spring force, relative to the gripping member by a distance and in a direction appropriate to compensate for cable elongation and lining wear. When the clutch pedal is depressed, the gripping member pivots relative to the pin to cause wall portions of the opening to grip the pin in tight frictional engagement to prevent movement thereof and allow for proper actuation of the clutch.

3,789,968

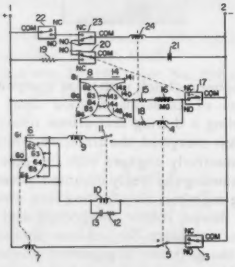
CONTROL SYSTEM OF A COIN-OPERATED LOCKER

Komei Inoue; Kazumi Yorisue, and Mitsuhiro Akamatsu, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji-Shi, Hyogo-Ken, Japan

Filed Sept. 15, 1972, Ser. No. 289,275

Int. Cl. G07f *17/12*

U.S. Cl. 194—1 N 5 Claims



A control system of a coin-operated locker or a rental locker which comprises coin detector detecting the insertion of coins into a coin inlet slot of the locker, a first counter for counting the number of coins detected by the coin detector, a second counter operating stepwise in correspondence to the completion of one operation of the locker, that is, from locking to unlocking of the locker and to the lapse of time, and a key-operation locking device enabling the locker to be locked or unlocked only when output signals from the first and second counter correspond to each other, whereby unlike conventional rental lockers, it is not necessary to reset all of the control circuits thereof to their original or initial condition whenever the door of the locker is opened to take a piece of baggage or the like out of the locker.

3,789,969

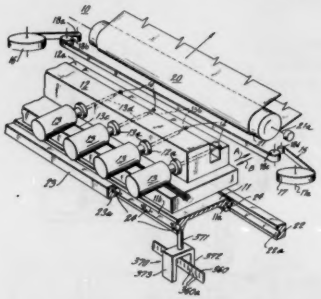
HIGH SPEED PRINTER

Robert Howard, Roslyn, N.Y., and Prentice I. Robinson, Hudson, N.H., assignors to Centronics Data Computer Corp., Hudson, N.H.

Filed Apr. 6, 1972, Ser. No. 241,782

Int. Cl. B41j *3/04*

U.S. Cl. 197—1 R 23 Claims



A control system for printers in which an elongated paper document is moved at a substantially constant speed. A plurality of reciprocally mounted solenoid operated print wires are mounted at spaced intervals upon a movable assembly arranged to move along a line transverse to the direction of movement of the paper document. The print wires are selectively operated by electronic and electromechanical means to impact an inked ribbon against the paper document for printing and/or plotting. The movable assembly is designed to fully compensate for the movement of the document to assure that all dots printed along a single row will form a straight line. While only selected ones of the print wires need be operated at any given instant, those selected for operation are all driven against the inked ribbon simultaneously to provide high speed printing and/or plotting of the dot matrix type.

Means are provided, in one preferred embodiment, for paper movement of one, five and twelve "dot" feeds to respectively provide for dot row spacing, character line spacing and line feed.

3,789,970

STRIKING DEVICE FOR A TYPEWRITER

Georges Costa, Yverdon, Switzerland, assignor to Paillard S. A. Vaud, Sainte-Croix, Switzerland

Filed Dec. 1, 1971, Ser. No. 203,515

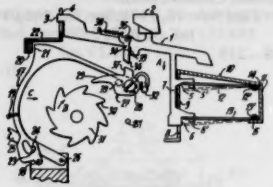
Claims priority, application Switzerland, Dec. 15, 1970, 18598/70

Int. Cl. B41j *23/08*

U.S. Cl. 197—17 4 Claims

The typewriter has type bars with key levers and guide and return means for the key levers. The guide and return means are constituted by flexible guide parts arranged in two sub-

stantially parallel rows and extending over the whole width of the machine keyboard. The guide parts are fixed by one of

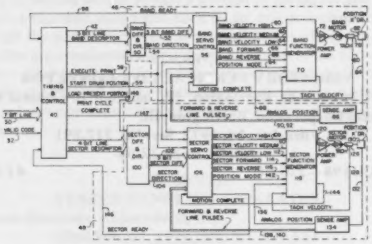


their ends on a support rigidly fixed to the frame of the machine, whilst their free outer ends cooperate with the said type levers.

3,789,971
SERVO CONTROL SYSTEM FOR A SERIAL PRINTER PRINT HEAD

Joseph P. Deyesso, Walpole, and Gaston A. Palombo, Chelmsford, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed June 21, 1971, Ser. No. 155,187
Int. Cl. B41j *23/04*
U.S. Cl. 197—18 **25 Claims**



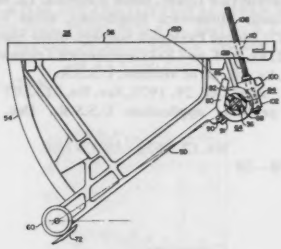
A novel print head positional control system for a serial printer is disclosed herein. The positional control system includes logic for determining the minimum displacements in each of two directions in order to move the print head to a new print position. The positional control system furthermore contains servo logic for implementing the determined minimal displacements in such a manner as to cause the print head to move in each direction at a number of different velocity levels depending on the magnitude of each minimal displacement. The positional control system also contains closed loop velocity servos which smoothly move the print head through the various velocity transitions to the next velocity level. The positional control system lastly contains a fine positioning servo that is switched to upon completing the final velocity approach to the new print position.

3,789,972
TRANSPORTATION DEVICE

Joseph K. Kraft, Gettysburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 25, 1972, Ser. No. 283,679
Int. Cl. B65b *9/12*
U.S. Cl. 198—16 R **11 Claims**

A transportation device including a flexible unit having spaced axles driven about a closed loop which includes a load bearing run. A plurality of steps, platforms or pallets are detachably fixed to the axles by a clamping arrangement which permits removal of the steps, platforms or pallets

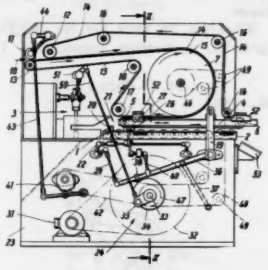


anywhere on the load bearing run without disassembly of the steps, platforms or pallets, the drive system, or surrounding structure.

3,789,973
MATERIAL CONVEYANCE SYSTEM FOR FEEDING WORKPIECES TO A PROCESSING TOOL

Walter Kugler, Adolf-Feucht-Weg, Neuffen/Wurtt, Germany

Filed Dec. 29, 1972, Ser. No. 319,333
Int. Cl. B23q *7/00*
U.S. Cl. 198—19 **14 Claims**



A material conveyance system usable for feeding workpieces formed of sheet material to a processing tool, such as a punch or perforator, and for extracting the workpieces therefrom. The workpieces are transported from a conveyor inlet station by pairs of endless belts arranged to hold the workpieces firmly between them until released at a transfer location onto a conveyor table horizontally aligned with the processing tool. Positioning members then assist insertion of the workpieces into the processing tool and align the workpieces for processing. The workpieces are extracted from the processing tool by the action of one of the pairs of endless belts circulating around a reciprocating frame arranged directly above and parallel to the conveyor table and are then transported rearward to a finished parts storage.

3,789,974

APPARATUS FOR TRANSFERRING THE BLANKS OF KNITTING NEEDLES IN THE PROCESS OF MANUFACTURE OF SUCH NEEDLES

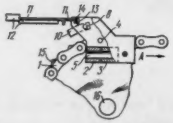
Alexandr Dmitrievich Afanasiev, ulitsa Kubinka, 6, kv. 35; Alexei Gavrilovich Lykov, ulitsa Kubinka, 12, korpus 4, kv. 30; Alexandr Moiseevich Mogilevsky, ulitsa Yablochkova, 41, kv. 27; Leonid Pavlovich Sokolov, ulitsa Slavyansky bulvar, 51/1, kv. 174, and Evl Gershkovich Fridman, ulitsa Kubinka, 6, kv. 20., all of Moscow, U.S.S.R.

Filed Dec. 29, 1971, Ser. No. 213,597

Claims priority, application U.S.S.R., Dec. 29, 1970, 1607854

Int. Cl. B65g *15/00, 47/00*

U.S. Cl. 198—20 1 Claim



An apparatus for transfering the blanks of knitting needles for knitting machines in which pairs of clamping jaws are mounted at uniformly spaced locations on a conveyor. The jaws are mounted so that the contact surfaces thereof extend parallel to the direction of progress, whereby they define a permanent base surface for the needle blanks being clamped.

3,789,975

DEVICE FOR USE IN TENTER TYPE STRETCHER FOR PREVENTING THE TORN-OFF EDGE OF FILM FROM RUNNING OFF THE NORMAL PATH

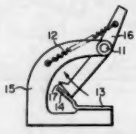
Saburo Ida, and Kuniharu Tobita, both of Yukagosei, Japan, assignors to Kabushiki Kaisha Oji Yukagoseishi Kenkyujo, Tokyo, Japan

Filed Nov. 26, 1971, Ser. No. 202,212

Claims priority, application Japan, Dec. 10, 1970, 45-108919

Int. Cl. B65g *19/00*

U.S. Cl. 198—180 1 Claim



A device for use in a tenter type stretcher is provided for preventing the torn off edge of the film from running off the normal path, said device comprising a liner consisting of a flat portion having a length and width sufficient for clipping a film thereon, and a tongue extending from said flat portion upwardly, and a clip lever pivotted to a clip body adapted for mounting said liner thereon, whereby the torn-off edge of the film, if it so happens when stretched laterally, may be prevented from running off the normal path behind said clip at the exit of the stretcher, said film being liable to be occasionally torn off lengthwise and made of a thermoplastic resin. (Such a film will be referred to as a film hereinafter).

3,789,976

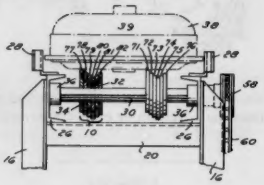
CONVEYOR

Dwight D. Paul, Jr., Mount Clemens, Mich., assignor to M. S. C. Inc., Mount Clemens, Mich.

Filed Nov. 18, 1971, Ser. No. 200,010

Int. Cl. B65g *25/04*

U.S. Cl. 198—219 5 Claims



A reciprocating bar conveyor having a plurality of parallel eccentrically supported bars angularly spaced from each other and grouped into at least two sets. Each set may be angularly spaced from each other set, and each set includes at least six bars which are individually angularly spaced from each other bar of the set. Each set of bars is supported on a pair of eccentric axles, only one of which need be connected to a drive motor.

3,789,977

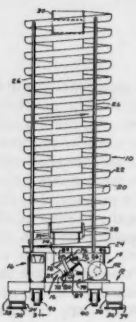
VIBRATORY VERTICAL LIFT CONVEYOR

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed Jan. 14, 1972, Ser. No. 217,891

Int. Cl. B65g *27/00*

U.S. Cl. 198—220 BC 4 Claims



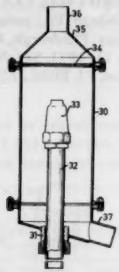
A vibratory vertical lift conveyor of the type employing a spiral ramp. The conveyor, in addition to the spiral ramp, includes a base vertically spaced therefrom, which base mounts a vibratory force imparting device which applies a generally vertically directed force to the ramp. The ramp is further connected to the base by means of elongated links, each of which is pivotally connected to the ramp at one end and pivotally connected to the base at the other. Each link is angularly disposed in a direction non-parallel to the direction of force application to the ramp.

3,789,978

METHOD AND APPARATUS FOR SEPARATING FINER PARTICLES FROM COARSE PARTICLES SUSPENDED IN A LIQUID

Bengt Gotthard Janson, Vegagatan 8, Stockholm, Sweden

Filed Apr. 20, 1971, Ser. No. 135,685
Int. Cl. B03b *1/00*
U.S. Cl. 209—10 **11 Claims**



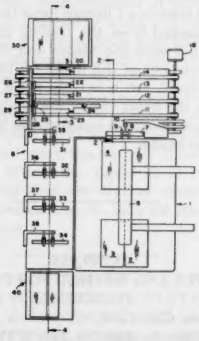
The present invention relates to a method and apparatus for separating finer particles from coarse particles suspended in a liquid by projecting the liquid, via a nozzle, in the form of a conical spray onto a screening member or strainer. A pressure difference is maintained between the pressures on either side of the screening means so that a portion of the liquid and finer particles together with a gas, such as air, are permitted to pass through the screening means to its outlet side whereas coarse particles are conducted away on the inlet side of the screening means. The invention is mainly characterized by a liquid column maintained on the outlet side of the screening means. This column communicates with the outlet side of said screening means.

3,789,979

VENEER HANDLING APPARATUS

Thomas Streckert, Abbottsford, Wis.

Filed Feb. 17, 1972, Ser. No. 227,153
Int. Cl. B07c *5/342*
U.S. Cl. 209—73 **15 Claims**



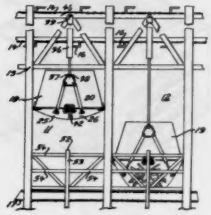
An improved material transferring system that permits reliable movement of material from one location through one or more angled movements to a second location. The transferring system is designed to handle irregular material such as veneer which may be warped, buckled, or torn without loss in reliability, and may be used in the transfer of veneer from the outfeed of a veneer splicer back to a load near the infeed of the same or another splicer. The transfer system can also automatically sense finished veneer pieces, and send them to a different location.

3,789,980

ACCUMULATOR APPARATUS FOR LUMBER SORTERS

Elmer Andrew Nagy, 15096-86th Ave., Surrey, B. C., Canada

Filed Oct. 20, 1972, Ser. No. 299,469
Int. Cl. C10g *37/02*
U.S. Cl. 209—74 R **5 Claims**



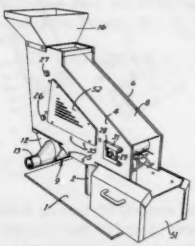
An accumulator for an automatic lumber sorter which includes a bucket supported by a hydraulic piston cylinder assembly for movement between an elevated lumber receiving position and a lower discharging position. The bucket bottom is closed by a pair of swinging doors which are hydraulically moved between open and close position. A gravity close latching device which normally releaseably locks the doors in a closed position when the bucket is in the elevated position is automatically released when the bucket is lowered to enable the doors to be opened.

3,789,981

PARTS SEPARATOR

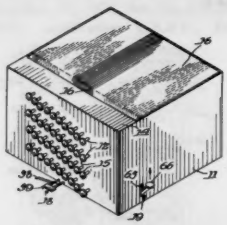
John H. Rossio, Portage, Mich., assignor to La Ros Equipment Company, Inc., Portage, Mich.

Filed Aug. 10, 1972, Ser. No. 279,500
Int. Cl. B07c
U.S. Cl. 209—78 **11 Claims**



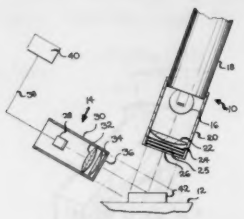
Separating device primarily for sorting separated but intermixed runners (and/or sprues) and molded parts discharged from a plastics molding machine. A belt carrying a series of projecting pins is arranged suitably around rollers to have at least one reach thereof oriented at a steep upward angle. The belt is driven in a direction such that it is moving upwardly as it passes through such reach. The pins are spaced apart transversley of said belt a distance so related to the size of the runners that such spacing is less than any dimension of the runners in at least one plane thereof and the parts are of less dimension in any plane than the transverse spacing of said pins.

3,789,982
RANDOM ACCESS CARD FILING AND RETRIEVAL APPARATUS
Walter Russell, Michigan City, Ind., assignor to Carol Ann Tolash; Victoria L. Tolash and Julianna Tolash, all of Michigan City, Ind., part interest to each
Filed Feb. 16, 1973, Ser. No. 333,403
Int. Cl. B07c *5/00*
U.S. Cl. 209—80.5 **12 Claims**



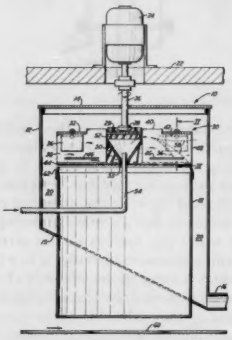
An apparatus for the selection and retrieval of randomly filed cards is provided by this invention and includes an outer housing, used to contain a plurality of coded-cards, a series of movable and individually operable selector knives which are used in conjunction with the coded or notched sections of each card to select and isolate specific cards from the large number of cards contained in the housing, and a card elevator mechanism which is used to lift and isolate the selected cards from nonselected cards. Other more detailed features of the invention are described in the specification.

3,789,983
METAL CAP SORTER
Albert P. Senesky, Camden, N.J., assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Sept. 16, 1971, Ser. No. 181,018
Int. Cl. B07c *5/342*
U.S. Cl. 209—111.6 **2 Claims**



Apparatus and method for sorting foreign closures from a stream of closures being fed into a capping machine. A light source is positioned at an acute angle with respect to the horizontal plane defined by the top panel of a metal closure. A light sensing unit is positioned at an angle with respect to the horizontal plane less than the angle of spectral reflection of the light from the light source. It has been found that each of a plurality of metal closures has unique light-scattering properties which may be measured by the light sensing unit positioned off of the angle of reflection of the light source. By introducing a plurality of closures into the light beam, a level may be established for each of the closures. By setting an electronic logic unit sensitive to the scattered light level of a particular desired closure, foreign closures which fall above or below this preset level may be rejected by a rejection mechanism. The rejection mechanism most frequently takes the form of a puff of compressed air to blow foreign closures from a line of closures being fed into a capping machine. The apparatus further includes a series of filters positioned over the light source to reduce the amount of light to an intensity level to which the light sensing unit is responsive.

3,789,984
CENTRIFUGAL CLEANER
Eber W. Gaylord, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Aug. 11, 1971, Ser. No. 170,839
Int. Cl. B01d *21/26*
U.S. Cl. 209—505 **15 Claims**

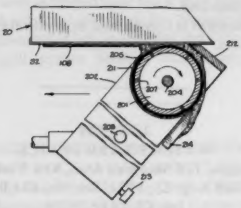


Apparatus for separating solid particles from liquid in a slurry in which radial blades are attached to a rotating base plate. The blades slope in a direction opposite the direction of rotation whereby the trailing edge of the blade is spaced from the base plate. Means are provided for delivering the slurry onto the inner end of the impellers near the surface of the base plate and for rotating the disc. The solid particles move rapidly in a radial direction along the impeller blades. That rapid movement creates a Coreolis force that causes the particles to be discharged from the trailing edge of the blades. Because the liquid wets the blades and the viscosity of the liquid slows movement of the liquid on the blades, Coreolis forces on the liquid are relatively small and the liquid is discharged from the outer end of the blades. The solid particles and liquid are collected separately as they are discharged from the impeller blades.

3,789,985
APPARATUS AND METHOD FOR CONTINUOUS FILTERING
William S. Eakins, Glen Cove, N.Y.
Division of Ser. No. 160,746, July 8, 1971, which is a continuation-in-part of Ser. No. 845,984, July 30, 1969, Pat. No. 3,615,011, which is a division of Ser. No. 578,361, Sept. 9, 1966, Pat. No. 3,460,674. This application Apr. 24, 1973, Ser. No. 354,151
Int. Cl. B01d *33/32*
U.S. Cl. 210—77 **34 Claims**

A traveling filter comprising a plurality of trays disposed to travel along a path, a plurality of frames adapted to travel

along a second path and through a portion of said path mate with the trays to confine material thereon, and a plurality of



conduit means adapted to travel along a third path and adapted to be advanced and retracted to establish communication with and discharge liquid from said trays.

3,789,986

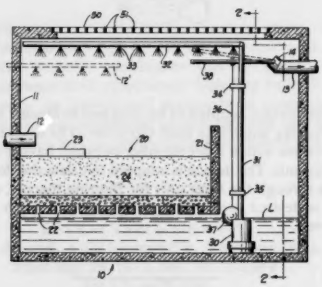
PIVOTABLE FLUID DIVERTER FOR RECIRCULATION SYSTEM

Robert R. Oldham, and John H. Wooddell, both of Sidney, Ohio, assignors to Robert R. Oldham, Inc., Sidney, Ohio

Filed Apr. 16, 1973, Ser. No. 351,273

Int. Cl. B01d *23/10*

U.S. Cl. 210—121 **7 Claims**



A reservoir for the final treatment of sewage is provided with a fluid diverter, one end of which is pivotally connected to and in open fluid communication with an outlet pipe. The fluid diverter is rigidly connected to a float responsive means on the surface of the liquid collected in the reservoir. A submersible pump within the liquid recirculates liquid by spraying it through a foraminous header disposed above the liquid level. When the liquid level in the reservoir falls below a predetermined liquid level, the diverter returns sprayed fluid to the reservoir. When the liquid level rises above the predetermined liquid level, the diverter diverts fluid into the outlet pipe and continues to do so until the predetermined liquid level is restored.

3,789,987

TRAP FOR THE SUBMERGED OUTLET OF A CATCH BASIN OR THE LIKE

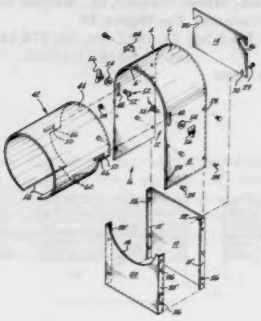
John A. Malaspina, 7929 S.E. 37th, Mercer Island, Wash.

Filed July 26, 1972, Ser. No. 275,234

Int. Cl. C02c *1/38*

U.S. Cl. 210—232 **7 Claims**

A trap for the submerged outlet of a catch basin or the like is disclosed. The trap comprises an inverted U-shaped hood which in use is oriented endwise of the outlet; and the distal upright end opening of which is closed to a point adjacent the bottom opening thereof, but the proximal end opening of which is closed in part only, by an arcuate panel which is connected across the lower portion of the opening in spaced relationship with the bight portion of the hood, so as to define a circular port between the arcuate edge thereof and the adjacent end edge of the bight portion. The hood is mated to the outlet by means of a split cylindrical collar which is oriented so that the split is disposed in the lower part cylindrical portion thereof; and which is telescopically engaged within the



port, to seal with the edges of the panel and the bight portion. The collar is also hingedly connected to the legs of the hood, to pivot in the vertical median plane of the proximal upright end opening thereof, and in order to maintain a seal with the bight portion of the hood, the collar has a coaxial part annular brow on the hood-adjacent end of the upper part cylindrical portion thereof, which extends within the hood from said portion, to a point on the opposite side of the hinge between the hood and the collar.

3,789,988

APPARATUS FOR REMOVING SURFACE POLLUTANTS FROM WATER AND OTHER LIQUIDS

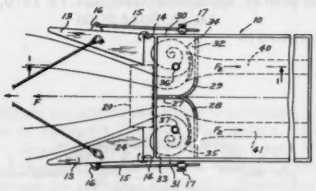
Bernard Valibouse, Grenoble, and Jacques Pichon, Saint Martin-d'Heres, both of France, assignors to Societe Grenobloise d'Etudes et d'Applications Hydrauliques (Sogreah), Grenoble (Isere), France

Continuation-in-part of Ser. No. 185,719, Oct. 1, 1971, abandoned. This application Mar. 14, 1973, Ser. No. 341,070

Claims priority, application France, Nov. 6, 1972, 7239209; Oct. 2, 1970, 7036478

Int. Cl. E02b *15/04*

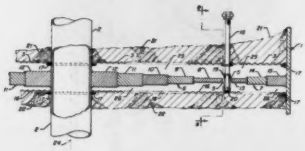
U.S. Cl. 210—242 **12 Claims**



The apparatus disclosed herein for removing layers of pollutants, such as oil, floating on a heavier liquid, especially water, depends for its operableness on the effect of the relative displacement speed of the heavier liquid and the overlying pollutant. Such relative speed is used to direct the removed layer of heavier liquid and pollutant, by tangential introduction, into at least one cyclone chamber wherein the induced rotation of the removed materials is caused as to create a whirlpool area in

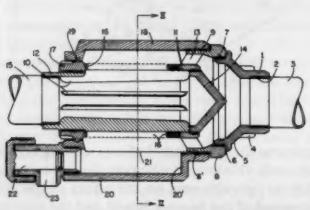
which the pollutant is concentrated. In the central portion of such concentration, the pollutant is extracted through a pipe fitting in the axis of and crossing the ceiling of the cyclone. The centrifuged water, free of pollutant, is discharged at the end of the cyclone.

3,789,989
FLOW DISTRIBUTION APPARATUS
Don B. Carson, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed July 24, 1972, Ser. No. 274,146
Int. Cl. B01d *23/10*
U.S. Cl. 210—284 **5 Claims**



A baffling and flow distribution apparatus for use in a system in which a fluid is desired to be passed from one bed of particles to another bed of particles with addition or withdrawal of fluids between the beds at a location within a baffling and flow distribution apparatus which itself is located between the beds. The invention includes two substantially parallel solids retaining screens which are spaced apart and which contain ribs between said screens which radiate from a central support hub. The screens also have placed between them a fluid deflection plate which has a passage in it and which has placed near the passage a fluid transfer means which can allow fluid when passing from one bed through the screens, through the passage through the other screen and into another bed, to pass by said transfer means so fluid may be added or removed from the apparatus. The above apparatus allows placement of the fluid transfer means within the apparatus at a position which can improve the flow characteristics of fluid materials passing from one bed through the opening into another bed.

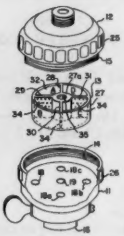
3,789,990
STRAINER FOR LIQUID PIPE LINES
Mordeki Drori, 89 Zahal St., Kiron, Israel
Filed Nov. 10, 1971, Ser. No. 197,305
Claims priority, application Israel, Nov. 15, 1970, 35651
Int. Cl. B01d *25/00*
U.S. Cl. 210—310 **8 Claims**



The invention relates to a strainer for fluid pipe lines containing a filter element coaxial with the pipe line and a fluid deflector. The latter causes the incoming fluid first to flow around the filter element in a direction substantially parallel to its axis and thereafter to flow perpendicular through it and out of its downstream end.

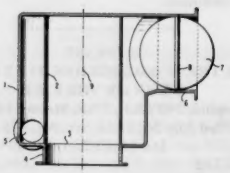
The filter element is constituted by a plurality of juxtaposed grooved washers.

3,789,991
WATER FILTER DEVICE
Zaharias Krongos, 128 Sherman Ave., New York, N.Y.
Filed Aug. 23, 1971, Ser. No. 174,084
Int. Cl. B01d *29/24*
U.S. Cl. 210—317 **4 Claims**



A filter device adapted to be attached to faucets and the like for removing impurities from tap water. The device comprises two sections with a filter member between having a replaceable filter unit. The device is adapted to cause the flow of water to pass through the filter unit for filtering thereof, or if no filtering is desired, water can pass directly through the device unfiltered.

3,789,992
SCREEN INSTALLATION FOR SEPARATING SOLIDS FROM LIQUID STREAMS IN PIPELINES
Friedrich-Wilhelm Treplin, Hoesel; Guido Veltmann, Wittlaer, and Heinz Thal, Lintorf, all of Germany, assignors to Ludwig Taprogge, Dusseldorf, Germany
Filed Nov. 8, 1971, Ser. No. 196,474
Int. Cl. B01d *29/42, 35/22*
U.S. Cl. 210—405 **13 Claims**



A screen installation for the separation of solids from liquid streams in pipelines, which comprises a separator housing with

built-in screen basket against which the liquid stream flows from the outside and which is connected with the housing wall at its open end; in addition to at least one discharge opening for the soiled water arranged near the screen base, the housing is provided with a lateral inlet pipe for the soiled water which includes an adjustable guide means for the tangential deflection of the liquid stream flowing transversely against the screen basket.

3,789,993

CELLULOSIC REVERSE OSMOSIS MEMBRANES HAVING HIGH FLUX AND HIGH SALT REJECTION

Barry M. Brown, and Elbert L. Ray, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 6, 1972, Ser. No. 215,810
Int. Cl. B01d *31/00*
U.S. Cl. 210—500 13 Claims

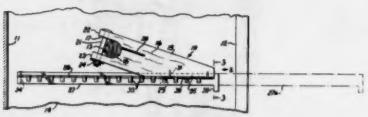
Using cellulose ester dope compositions in which the solvent portion contains a high proportion of formic acid, cellulosic reverse osmosis membranes can be manufactured. These membranes have surprisingly high flux and salt rejection properties, an unexpected resistance to compaction at high pressures over prolonged periods of time and salt rejection properties that are practically independent of applied pressure.

3,789,994

RETRACTABLE TIE RACK

Rodrick J. Koutnik, 1420 Morrow Cir., Thousand Oaks, Calif.

Filed May 15, 1972, Ser. No. 253,498
Int. Cl. A47f *5/08*
U.S. Cl. 211—86 5 Claims



A retractable tie rack for attachment to a clothes supporting rod within a clothes closet, including a one-piece elongate bracket which when attached to the support rod inclines downwardly toward the closet door opening. The lower end of the bracket terminates in a horizontal slide bearing for a hanger bar having spaced tie supporting pins thereon. When the hanger bar is extended, any ties or similar articles carried thereby are readily accessible. The upper end of the bracket has a lengthwise extending open-ended slot adapted to fit over the support rod and a lengthwise extending slit opening into such slot to enable the portions of the bracket on opposite sides of the slot and slit to flex. A clamp bolt extending through such portions is effective to frictionally clamp the same against the support rod.

3,789,995

HANGERS FOR PORCELAIN ENAMELLING FURNACES

James M. Annal, Evergreen Park, Ill., assignor to The Fahralloy Company, Harvey, Ill.

Filed May 19, 1972, Ser. No. 255,014
Int. Cl. A47f *5/08*
U.S. Cl. 211—113 9 Claims

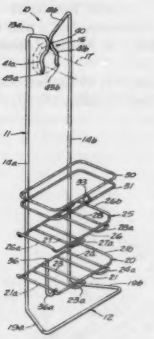
A multi-piece hanger for porcelain enamelling furnaces which can be assembled from sections of relatively short length. Because of the ability to build up a burning tool of any desired size from short sections, shell molding may be used for hangers of even large sizes, thereby eliminating problems connected with green sand molding.

3,789,996

SHELF FIXTURE INCLUDING AN ATTACHMENT DEVICE THEREFOR

Alvin L. Stroh, Downey, Calif., assignor to McMillan Wire and Plating, Inc., Los Angeles, Calif.

Filed May 12, 1971, Ser. No. 142,623
Int. Cl. A47f *5/08, 5/14*; A47h *1/16*
U.S. Cl. 211—119 5 Claims



A shelf fixture for attachment to the water supply pipe of a stall shower is disclosed. The fixture includes a main frame formed of a single length of steel wire. The length of wire is bent so that the opposite end portions thereof located at the top of the frame are anchored together at a point and shaped to form an attachment device for the fixture. The opposite end portions of the wire for the attachment device is formed with extension portions extending downwardly from the anchor point prior to forming opposing outwardly curved portions which are made to tightly fit over the pipe. The terminating ends of the curved portions are located a sufficient distance from the anchor point because of the extension portions to provide an increased power of action for spreading the terminating ends to enable the attachment device to be readily snapped in a secure position over the pipe.

3,789,997

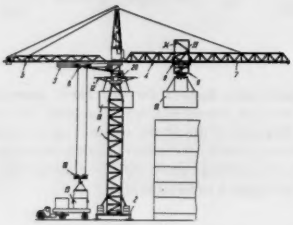
TOWER CRANE

Anatoly Avgustinovich Kozlovsky, Oruzheiny pereulok, 25, kv. 190; Nikolai Evgenievich Paschenko, Rostovskaya naberezhnaya, 5, kv. 150; Vladimir Grigorievich Polyakov, ulitsa Alabyana, 3, kv. 290, and Iosif Yakovlevich Kogan, 6-oi Novopodmoskovny pereulok, 4, kv. 9, all of Moscow, U.S.S.R.

Continuation of Ser. No. 28,747, April 15, 1970, abandoned. This application Nov. 1, 1971, Ser. No. 194,761

Int. Cl. B66c 17/06

U.S. Cl. 212—11 4 Claims



A tower crane, in which disposed on a non-rotary tower on the opposite sides thereof, are two booms having guides for the movement of load carriages with their load holding arrangements, and mounted on the tower under the booms is a rotating device to receive loads from the load holding arrangement of the first boom, and transfer loads to the load holding arrangement of the second boom.

3,789,998

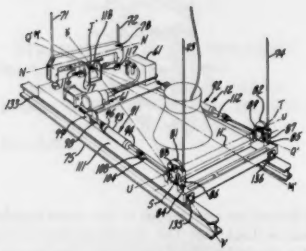
HOISTING EQUIPMENT INCLUDING SPREADER WITH LONGITUDINAL AND TRANSVERSE TILTING MECHANISM

Jack E. Fathauer, Roxboro, N.C., and Carl R. Gottlieb, Mobile, Ala., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 17, 1972, Ser. No. 218,188

Int. Cl. B66c 19/00, 1/66

U.S. Cl. 212—125 13 Claims



Hoisting equipment adapted especially for handling cargo containers including a spreader which may be adjustably tilted to facilitate entry of containers into a cargo vessel varying in its condition of list or trim. The equipment includes a crane and cables pendently supporting the spreader from the crane and shortenable and extendable coupling devices associated with the spreader which may be selectively operated to change the effective lengths of at least certain of the cables while independently of the cable-reeling mechanism on the crane. A further aspect of the equipment is linear adjustability of each cable with respect to the spreader and the coupling devices.

3,789,999

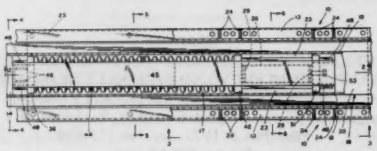
CUSHIONED UNDERFRAME FOR RAILWAY CARS

Robert S. Tamborski, Griffith, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 16, 1972, Ser. No. 298,181

Int. Cl. B61g 9/08

U.S. Cl. 213—8 6 Claims



A cushioned underframe includes a stationary sill having a sliding sill supported therein. A cushion device is supported within the sliding sill and is anchored to a carrier and cover plate connected to the underneath side of the stationary sill. Integral sill lugs on the sliding sill are disposed between a spring retainer plate and a stationary plate connected to a tension strap on the cushion which during reciprocation of the sliding sill provides for operation of the cushion. The carrier and cover plate and the cushioning unit mounted thereon may be installed and removed as a unit with the cover and carrier plate.

3,790,000

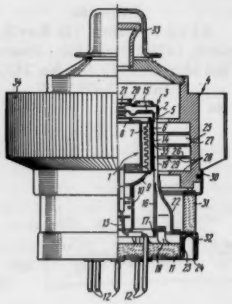
MULTI-ELECTRODE ELECTRON TUBE

Valery Nikolaevich Manyafov, Grazhdansky prospekt, 15, korpus 4, kv. 93; Anatoly Ivanovich Busheev, Kolomenskaya ulitsa, 27, kv. 14; Roman Lvovich Semenov, prospekt Engelsa, 60, kv. 7, and Valery Alexeevich Klevtsov, Aprakin pereulok, 21, kv. 69, all of Leningrad, U.S.S.R.

Filed July 3, 1972, Ser. No. 268,888

Int. Cl. H01j 1/46

U.S. Cl. 313—299 6 Claims

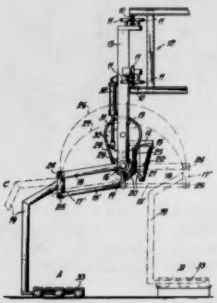


A multi-electrode electron tube is disclosed in which between the cathode and the chamber anode there is provided a control grid composed of wires. The chambers of the chamber anode are formed by fins arranged perpendicularly to the anode surface facing toward the cathode, and a bottom which is a part of the anode surface facing the cathode and contained between the fins. At points of normal projections of each fin of the chamber anode on the control grid and/or the cathode there are disposed elements for directing the electron flow from the cathode to the bottom of the chambers of the chamber anode arranged so as to form a plurality of sections, each including a part of the emitting cathode surface, part of the control grid wires and the bottom of a corresponding chamber of the chamber anode positioned parallel to one another in the direction of the electron flow.

3,790,001
CONVEYING ARRANGEMENT

Gerhard Schnell, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 3, 1971, Ser. No. 139,611
Claims priority, application Germany, June 24, 1970, P 20 31 170.0
Int. Cl. B65g 47/90
U.S. Cl. 214—1 BD 8 Claims

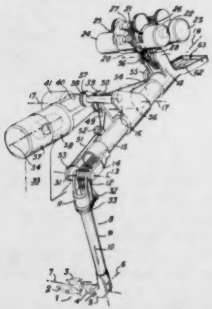


A carriage is movable on rails at opposite lateral sides of which objects are to be deposited or picked up. A turnable shaft is provided on the carriage and connected with a parallel-movement linkage, including a toggle joint, to a free end of which there is connected a gripper for engaging objects to be conveyed. A cylinder and piston unit is connected with the pivot of the toggle joint, so that when the unit is operated, the latter collapses and the gripper engages from below an object to be lifted, whereupon turning of the shaft causes the parallel movement to perform an arcuate movement so that the object is moved from one side of the rails to the other for deposition thereat.

3,790,002
MANIPULATOR WITH DRIVE MOTORS

Jean-Claude Germond, Paris; Charles Glachet, Vendome; Jean-Pierre Guilbaud, Jou Ars-Pontchartrain, and Jean Vertut, Issy-Les-Moulineaux, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Oct. 10, 1972, Ser. No. 296,054
Claims priority, application France, Oct. 11, 1971, 7136470; May 10, 1972, 7216859
Int. Cl. B25j 3/00
U.S. Cl. 214—1 CM 13 Claims



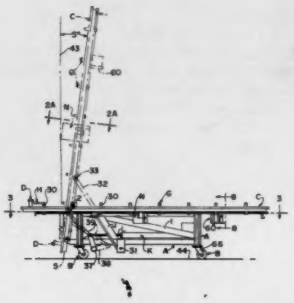
The manipulator arm is pivoted at its mid-point on a laterally displaced shoulder pin coupled to a rotatable body which has a horizontal axis on one side of said arm and serves to rotate the complete manipulator assembly about said axis.

A drive-motor block which produces a continuous balancing action about the shoulder-pin axis is pivotally mounted on one end of the manipulator arm in laterally displaced relation thereto. A wide range of angular motion is thus imparted by cable-type transmission means to a fore-arm which is rotated about an elbow pin or in azimuth and to a tong unit which is subjected to movements of elevation, rotation and closure.

3,790,003
TILTABLE GLASS CUTTING TABLE

Russell W. Tausheck, Hayward, Calif., assignor to ACE Glass Co., Hayward, Calif.

Filed Nov. 15, 1972, Ser. No. 306,719
Int. Cl. B65g 7/00
U.S. Cl. 214—1 S 15 Claims



A power operated tiltable glass cutting table with novel means for removing a large sheet of glass from either a front opened or end opened case while the table top is inclined at a slight angle from a vertical position and without the operator having to touch the glass. The lower edge of the table top when in an upwardly inclined position is provided with retractable rubber rollers upon which the lower edge of the large sheet of glass rests preparatory to returning the table top to a horizontal position. A plurality of free revolvable spherical balls are arranged in spaced apart relation over the entire upper surface of the table top and are normally spaced above the table top so as to support the glass and permit the ready movement of the glass sheet over the table top. A single operator can handle a large sheet of glass with safety.

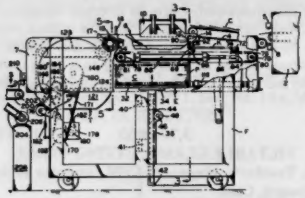
3,790,004
APPARATUS FOR AUTOMATICALLY STACKING MATERIAL

Ingvar L. Tole; Vernon J. Herzing; Everett L. Miller, all of Battle Creek, and George L. Lightfoot, Bellevue, all of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 795,187, Jan. 30, 1969, Pat. No. 3,580,402. This application Jan. 18, 1971, Ser. No. 107,496
Int. Cl. B65g 57/11
U.S. Cl. 214—6 H 20 Claims

This invention relates to apparatus for forming stacks or piles of sheet material, such as flat carton blanks (hereinafter also referred to merely as cartons), and delivering them in properly arrangd condition so as to be available for set-up or shipment. Cartons are conveyed from a cutting press to an assembly magazine in one or more laterally spaced single file lines. Each line of cartons entering the magazine is jogged or shuffled to form a neat stack or pile on a vertically movable elevator in the magazine. In response to the action of sensing mechanism, the elevator is lowered progressively carrying with it the piled cartons until a controlled separator is pro-

jected between adjacent cartons of the pile to separate stacks of desired height or number of cartons therefrom, whereupon



the elevator is lowered to a predetermined discharge position. A horizontally movable pusher is then operative to eject each stack beneath the separator from the elevator.

3,790,005

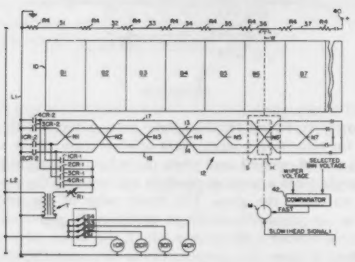
NULL TRACK FOR AUTOMATIC STACKER

Harry E. Smith, Newark, N.Y., assignor to Hartman Metal Fabricators, Inc., Victor, N.Y.

Filed Apr. 3, 1972, Ser. No. 240,547

Int. Cl. B66b *1/02*

U.S. Cl. 214—16.4 A **7 Claims**



Two pairs of null wires extend down an aisle in front of a storage rack that is serviced by an automatic stacker. The two wires of each pair are crossed and recrossed at intervals to form spaced crossover points or nulls, which register with horizontally spaced bins in the rack. The nulls of the two pairs alternate with one another, one pair of wires registering with odd-numbered bins, and the nulls of the other pair registering with the evenly-numbered bins. When the stacker control circuit is programmed to move the stacker to a preselected bin, an AC voltage is applied selectively to the four null wires to create stable nulls at every fourth bin. The stacker is then halted by known means at a preselected stable null.

3,790,006

POSITION CONTROL SYSTEM FOR A WAREHOUSE APPARATUS

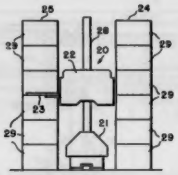
Elmer C. Hartman, III, Geneva, N.Y., assignor to Hartman Metal Fabricators, Inc., Victor, N.Y.

Continuation of Ser. No. 73,159, Sept. 17, 1970, abandoned. This application Nov. 15, 1972, Ser. No. 306,862

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 A **12 Claims**

An automatic stacker or load carrier has a trolley section movable down an aisle between a pair of storage racks, an elevator movable vertically on the trolley, and a retractable fork mechanism movable out of either side of the elevator to pick up a load from, or deposit a load into, a selected bin in one of the racks. A stationary console remote from the stacker is connected electrically to the stacker by a plurality of brush contacts on the stacker, which have sliding, electrical contact with a like plurality of conductors, which extend from the console down the aisle. By means of a computer connected to the



console, an operator can program the stacker to perform a plurality of successive pick up and deposit operations to transfer loads between selected bins and a loading station at one end of the aisle, or between selected bins in the racks. At the end of each cycle, which comprises either a pick up or deposit operation, the stacker remains stationary until the computer enters the address of a new cycle.

3,790,007

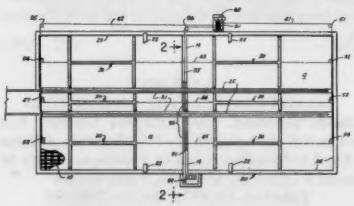
ABRASIVE RECOVERY SYSTEM

Brinton Sprague, R. 5, Box 5821, Bainbridge Island, Wash.

Filed Nov. 9, 1971, Ser. No. 197,089

Int. Cl. B24c *7/00*; **B65g** *25/08*

U.S. Cl. 214—17 D **8 Claims**



An abrasive recovery system comprising a perforated floor above a solid floor having a channel therein. Scraper assemblies are mounted above the solid floor for reciprocating movement across the floor toward and away from the channel. The scraper assemblies may be provided with pivoting blades adapted to pivot away from the floor when the scraper assemblies move away from the channel. A power source is connected to the scraper assemblies for reciprocation thereof. A conveyor may be located in the channel to convey collected abrasives away from the floor.

3,790,008

RAILWAY HOPPER CAR

Robert Montaque Joubert, Potchefstroom, South Africa, assignor to Rotaque (Proprietary) Limited, Potchefstroom, Transvaal Province, South Africa

Filed June 6, 1972, Ser. No. 260,189

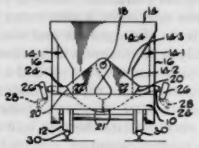
Claims priority, application South Africa, June 9, 1971, 71/3725

Int. Cl. B61d *7/04*, *7/18*, *7/32*

U.S. Cl. 214—63 **7 Claims**

The invention relates to a bottom discharge hopper or hopper car having radial doors across an open bottom of a

container and pivotally suspended about a common horizontal axis. The doors form collectively, a closure across the open



bottom and are caused to be simultaneously swung in upward and outward directions for gravitational discharge of the container.

3,790,009

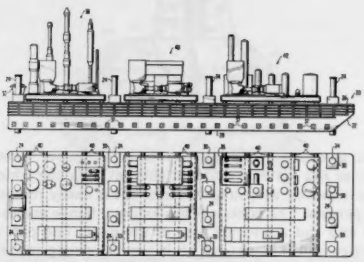
METHOD FOR HANDLING A BARGE FOR TRANSFERRING LARGE HEAVY CARGO MODULES

Ferdinand R. Hauber, Galena Park, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed Nov. 7, 1972, Ser. No. 304,308

Int. Cl. E02b *17/02*

U.S. Cl. 214—152 **17 Claims**



A method of handling a barge for transferring large, heavy cargo modules onto the barge from a dock facility or off of a barge onto a dock facility including the steps of positioning the barge, buoyantly supported upon a body of water, contiguous to a dock facility; lowering a plurality of columns vertically through a corresponding plurality of wells in the hull of the barge and into engagement with the water bed adjacent the dock; extending a plurality of columns into the water against the weight of the barge, until the columns have reached a firm foundation. Following the step of extending the columns into the water bed sufficiently to support the barge, opening at least one valve positioned within a corresponding at least one passage through the hull of the barge to permit the ambient water to seek its own level within the interior of the barge and thus render the barge independent of normal buoyancy and tidal influences. Next the barge is vertically adjusted upon the columns until the deck of the barge is in generally planar horizontal alignment with the dock facility. The cargo modules may then be transfered onto or off of the barge. Once the transfer is completed, then at least one valve positioned within the hull of the barge is closed and finally the plurality of columns are raised to enable the barge to again be buoyantly supported upon the body of water.

In the event a particularly heavy construction module is going to be loaded from a dock facility onto a barge ballast may be added to the barge prior to extending the columns into the water bed. Moreover, the amount of ballast utilized may be selected to correspond to the weight of the construction module to be loaded in order to minimize the possibility of relative vertical movement of the barge deck with respect to a dock as the module is loaded onto the barge.

3,790,010

MECHANICAL HANDLING OF GOODS

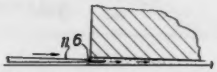
James Alexander Stirling, 5 Stonemead, Welwyn Garden City, and Gordon Carlton, St. Cross St., London, both of England

Filed June 4, 1971, Ser. No. 150,011

Claims priority, application Great Britain, Dec. 8, 1970, 58,253/70

Int. Cl. B65g *1/14, 7/02*

U.S. Cl. 214—152 **2 Claims**



This invention provides a method for the mechanical handling of goods in which the goods are stacked upon a flat flexible pallet, in the form of an envelope with a mouth at one end, which takes up very little space and which will not support the goods when the goods are to be moved. To lift the goods the pallet is partially inflated through the mouth by blowing air into the envelope and a rigid supporting member is introduced into the envelope through the mouth so that the goods can be lifted, moved and put down again whereupon the supporting member can be removed and the air supply turned off so that the pallet lies flat again.

3,790,011

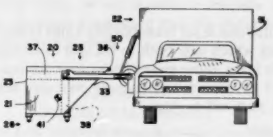
PIVOTABLE REFUSE CART DUMPING APPARATUS WITH HORIZONTALLY MOVABLE AND SPREADABLE ARMS

Thomas G. Owen, Jr., R.R. 7, Box 250, Bloomington, Ind.

Filed Dec. 1, 1971, Ser. No. 203,815

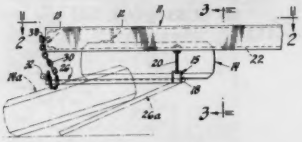
Int. Cl. B65f *3/02*

U.S. Cl. 214—302 **5 Claims**



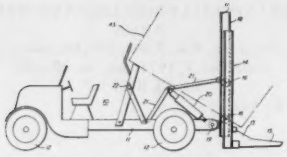
A dumping apparatus having a pair of arms mounted to a truck for engaging a refuse cart. The arms are pivotally mounted to a beam which is slidable horizontally to and from the truck by a cylinder motor. The beam is mounted to a pair of channels which are slidably mounted to a second pair of channels fixedly attached to the truck. The cylinder motor is attached to the truck and has a piston rod connected to the beam. A second cylinder motor mounted to the truck has an extendable piston rod connected to a lever which is fixedly connected to a shaft upon which the arms are hingedly mounted. A pair of cam plates mounted to the truck receive cam followers rotatably mounted to the arms which are urged against the cam plates by a pair of springs. The cam plates diverge and extend beneath the arms thereby allowing the arms to spread apart as they are pivoted downward past the horizontal position. A pair of slotted hands are mounted to the ends of the arms for receiving handles mounted to the refuse cart. The handles are slidable through the slots so as to achieve a shaking motion of the cart.

3,790,012
SPARE TIRE AND WHEEL CARRIER
John Hrivnyak, 2055 Harward, Berkley, Mich.
Filed June 7, 1972, Ser. No. 260,425
Int. Cl. B62d 43/00
U.S. Cl. 214—454 5 Claims



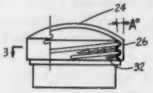
A spare tire and wheel carrier for a pickup truck, camper and the like which includes a transverse member having a pair of angled tire clamping shoulder portions. A hanger means is disposed at each of said transverse member and it has a lower end pivotally connected to the transverse member and an upper end fixed to the frame of the vehicle. The carrier includes a center supporting arm which has its inner end secured to the transverse member and means for releasably securing the center arm to the vehicle frame.

3,790,013
FORK-LIFT WHEELED VEHICLE
George Frederick Smith, Goodlands Farms, Shamblehurst Ln., Southampton, England
Filed June 23, 1971, Ser. No. 155,882
Int. Cl. B66f 9/20
U.S. Cl. 214—674 3 Claims



A fork-lift vehicle for transporting bales is disclosed, having a tilting fork which acts both to lift and to transport the bales. The vehicle has a static guard frame co-operable with the fork in its tipped position to form a cage, movable side gates on the fork, and a push-off device.

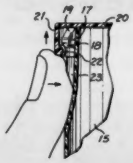
3,790,014
SAFETY CLOSURE AND CONTAINER
Michael Mucsi, 2474 S. Centinela Ave., Los Angeles, Calif.
Filed Apr. 13, 1972, Ser. No. 243,807
Int. Cl. B65d 55/02
U.S. Cl. 215—9 11 Claims



In an internally threaded closure for a container having an externally threaded neck, one or more ramplike ratchets are disposed on the internal thread of the closure for releasably interlocking with corresponding and mating ratchet detents disposed within the groove adjacent to the turns of the external thread on the neck of the container. The configuration of the ratchets and detents is such that the ratchets will easily slide into and out of successive detents and, thus, permits conventional closing of the container by ordinary rotation of the closure relative to the container. Reverse rotation of the closure relative to the container is prevented by corresponding locking side walls on the ratchets and detents which are in planes substantially in alignment with radii to the center of the package. The closure has a side wall and a resilient top wall. The closure is removed from the container by simultaneously rotating the closure relative to the container and pressing on the resilient top wall to dilate the side wall and disengage the ratchets from the ratchet detents.

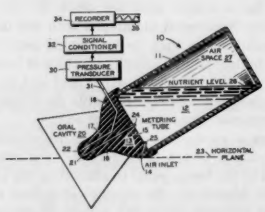
In a variational embodiment, the ratchets are disposed on the groove of the neck of the container and the ratchet detents are disposed within the lateral side of the internal thread of the cap.

3,790,015
SAFETY CONTAINER AND CAP
Harry H. Imamura, 5212 28th Ave. South, Seattle, Wash.
Filed July 13, 1972, Ser. No. 271,496
Int. Cl. B65d 55/02
U.S. Cl. 215—9 9 Claims



This invention comprises a tubular container formed of plastic or like resilient material and having a cap which can not be removed by young children but is easily removed by older persons. The container has external flange means on its upper end and a selected area of the upper end part of the container wall is weakened so it can be sprung inwardly to either receive or release a cap and will always spring back to its original position when released. A cap fits over the top end of the container and has internal flange means which will interlock with the external flange means on the container. The only way to release and remove the cap is to bend the weakened upper part of the container wall inwardly by applying external pressure to it and immature children can not do this.

3,790,016
INSTRUMENTED NEWBORN NURSING SYSTEM
Reuben E. Kron, Narberth, Pa., assignor to The Trustees of the University of Pennsylvania, Philadelphia, Pa.
Filed Dec. 13, 1971, Ser. No. 207,360
Int. Cl. A61j 9/00
U.S. Cl. 215—11 R 6 Claims



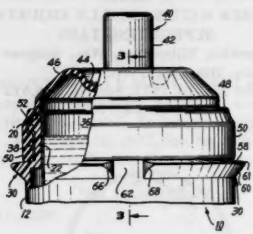
An infant nursing device comprising a chamber for containing liquid contiguous to a nipple having an air inlet passage

communicating from the ambient atmosphere to the chamber, a liquid metering passage communicating from the chamber and through a centrally protruding exterior portion of the nipple, and either a pressure indicative passage communicating from the centrally protruding exterior portion to another region or means communicating with the liquid metering passage for measuring the rate of flow therein. All are so arranged that the device is conveniently positionable for delivery of the liquid to an infant whose oral cavity surrounds the centrally protruding exterior portion of the nipple, with the air inlet passage communicating with the ambient atmosphere in substantially the same horizontal plane at which the exterior end of the liquid conductive passage is positioned, and with the inner ends of the liquid metering and the air inlet passages below the level of the liquid as long as the liquid occupies a substantial portion of the space in the chamber.

3,790,017
NURSING UNIT

William E. Fitzpatrick, Wyckoff, and Robert B. Cubitt, Ramsey, both of N.J., assignors to International Playtex Corporation, New York, N.Y.

Filed Aug. 8, 1972, Ser. No. 278,856
Int. Cl. A61j *9/04*
U.S. Cl. 215—11 E **12 Claims**

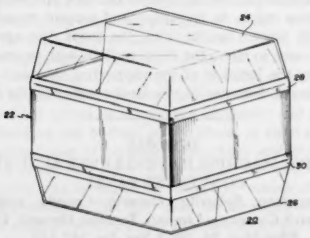


A nursing unit is disclosed including a holder, a liquid-retention sac, and a nipple wherein the holder is provided with a discontinuous annular shoulder, which substantially reduces the possibility of accidental or inadvertent nipple removal.

3,790,018
CONTAINER

Paul Farkas, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Aug. 18, 1971, Ser. No. 172,833
Int. Cl. B65d *11/10, 25/04*
U.S. Cl. 220—4 C **3 Claims**



A container for storing elongated articles having different heights at their respective ends permitting maximization of the storage capacity in a minimum amount of volume. The rectangular container body defines a hollow chamber therein and has covers at either end, individually, selectively removable from the container body. At least one inclined intermediate wall placed within the container body segments the chamber into chamber portions some of which are accessable by removing a first of the covers and others of which are accessable by removing the second of the covers. By the inclusion of additional intermediate walls, the chamber can be further divided to increase the utility of the container. Selective shaping of the container covers permits nesting of the covers within one another and the container body to be angularly positioned within the covers to facilitate access to the articles stored within the container body.

3,790,019
STACKABLE PACKAGE AND METHOD OF MAKING SAME

Lowell C. Murray, and John M. Hoge, both of Fort Wayne, Ind., assignors to Container Corporation of America, Chicago, Ill.

Filed Dec. 20, 1971, Ser. No. 209,585
Int. Cl. B65d *5/00*
U.S. Cl. 220—16 R **10 Claims**

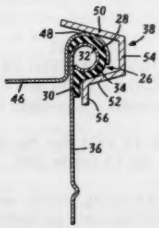
A package is formed from a pair of rectangular panels, one having greater length than the other, and being in overlying relationship with respect thereto. The ends of the panels are constrained so that each is bowed slightly with the same chordal distance between the ends, the longer panel being thereby spaced from the shorter one. Each of the panels has side panel segments defined by a score line extending longitudinally of the panels and between opposite ends thereof. Upon curving of the rectangular panels as aforesaid, the side panel segments are brought into contacting relationship and are secured together by adhesive material. In bringing the side panel segments into contact, a pair of opposite side flanges for the receptacle is formed, these aiding in the stacking of the finished receptacle.

In a preferred form of the invention the two rectangular panels may be foldably connected and the distal ends thereof secured together by adhesive.

3,790,020
DRUM SEAL GASKET

Harry H. Fine, 144-14 Jewel Ave., Kew Garden Hills, N.Y.

Filed June 5, 1972, Ser. No. 259,546
Int. Cl. A47j *27/08, 36/10;* **B65d** *45/00*
U.S. Cl. 220—46 R **1 Claim**



An open head drum has a head curl which receives a gasket, and a cover to effect closure of the drum. The gasket includes one portion formed as an annulus having an interiorly

disposed channel in which the head curl is received and a skirt portion engaging the outside wall of the drum. A cover for the drum has a lip engaging the gasket annulus at the top surface of the drum curl. A locking ring has an upper lip pressing the cover lip toward the drum curl and a lower lip pressing the gasket annulus against the underside of the drum curl. The locking ring also has an annular skirt for pressing the annular lip of the ring gasket against the outside surface of the drum.

3,790,021

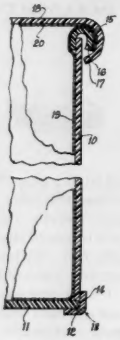
PLASTIC CONTAINER WITH DISPOSABLE INNER CONTAINER

Isabel W. Bailey, 8341 S.W. 137th Ave., Miami, Fla.

Filed June 30, 1972, Ser. No. 267,898

Int. Cl. B65d *25/14, 25/34*

U.S. Cl. 220—63 R **5 Claims**



A lightweight container for soft drinks or the like comprising an outer cylindrical container of form-retaining plastic and a disposable inner container of thinner, flexible plastic which takes the shape of the outer container. Stiffening rings are placed at the top and bottom of the outer container, the top ring overhanging the upper edge of the outer container and receiving the crimped-over edge of a metallic cap. The material of the liner is polyester of approximately 1½ mils thickness and that of the outer container is either polyester or 5 mil Mylar conditioned by laminates or otherwise to withstand the elements, or a laminate of these materials.

3,790,022

APPARATUS FOR SEPARATING ARTICLES INTO NUMERICALLY UNIFORM GROUPS

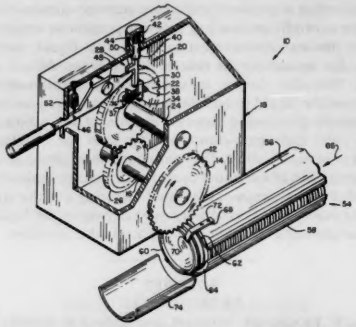
Archie L. Lind, Lakewood, Colo., assignor to Bau Corporation, Muncie, Ind.

Filed Dec. 13, 1971, Ser. No. 207,411

Int. Cl. G06m *7/00*

U.S. Cl. 221—2 **1 Claim**

An apparatus for separating articles, such as, for example, container lids, into groups, each containing a predetermined number of articles, is disclosed herein. The apparatus includes an article separating member having a predetermined number of article engaging means. The separating member is connected with a support housing for allowing the engaging means to rotate along a predetermined path so as to engage different ones of a plurality of said articles during movement along said path. The separating member is limited to a



predetermined amount of movement along said path so that a predetermined number of articles can be separated into a single group.

3,790,023

CUP DISPENSER WITH RADIALLY ADJUSTABLE CUP SUPPORTING TABS

Edwin A. Filipowicz, Milwaukee, Wis., assignor to Griffith-Hope Company, Milwaukee, Wis.

Filed Jan. 10, 1972, Ser. No. 216,612

Int. Cl. A47f *1/08*

U.S. Cl. 221—304 **16 Claims**

A cup dispenser capable of dispensing cups of different diameter. The dispenser includes a tube to contain a stack of cups and the cups are individually dispensed through an open end of the tube. The cup located adjacent the open end of the tube is supported on a series of tabs or ledges which extend inwardly from adjustable support members. Each support member comprises a flexible spring-like strip which extends through an opening in the tube and the outer end of the strip is secured to a collar that surrounds the tube. A series of cams are integral with the inner surface of the tube and bear against the respective strips. As the collar and support members are rotated with respect to the tube, the strips ride against the respective cams to move the strips radially with respect to the tube to vary the location of the supporting tabs and thereby enable different diameter cups to be supported on the tabs.

3,790,024

VENDING MACHINE HAVING LEVER ACTUATED CONVERTER PANEL

Berend Stegeman, Belleville, Ontario, Canada, assignor to Eddy Match Company, Limited, Toronto, Ontario, Canada

Filed Mar. 16, 1973, Ser. No. 342,311

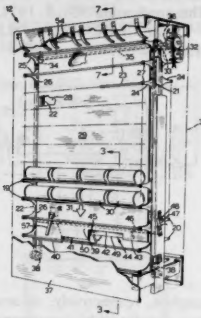
Claims priority, application Canada, Apr. 21, 1972, 140216

Int. Cl. B65g *47/34*

U.S. Cl. 221—77 **12 Claims**

A vending machine having a rack assembly comprising endless side chain members, product shelf rods attached to the

chain members, rear and front product back rests on which the product items slide, the front back rest having a lower end forming a vend panel with stepped portions therein allowing



vending of product one at a time backwardly into the assembly from each shelf rod and a converter panel assembly rotatable into the vend panel to allow vending of different sized product.

3,790,025

APPARATUS FOR PACKAGING TUBULAR ARTICLES

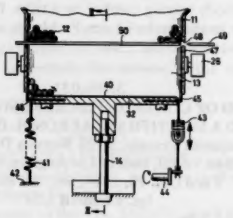
Helmut Brodbeck, Trossingen, Germany, assignor to EFKA-Werke Fritz Kiehn GmbH, Trossingen/Wurtt, Germany

Filed Sept. 18, 1972, Ser. No. 290,066

Claims priority, application Germany, Sept. 30, 1971, P 21 48 870.0

Int. Cl. B65h *3/00*

U.S. Cl. 221—200 **13 Claims**



A device for sorting and packing round-bar-shaped or tubular articles and, more particularly, cigarette tubes or cigarette filter tubes. The device comprises a funnel-shaped container the downwardly tapering portion of which terminates in a chute having a bottom, side walls and a front wall, the front wall being designed as an ejector and the rear wall having an ejector orifice; a cut-off slide, or a plurality of cut-off slides arranged in pairs, and disposed between the container and the chute which serves as a batching chamber; and a belt which rests flatly on the bottom of the chute at right angles to the longitudinal axes of articles in the chute and/or on the inner surfaces of the side walls of the chute. The belt is adapted to be reciprocated or gradually moved by means of an external drive mechanism. The belt may be arranged with one end thereof outside the chute and attached to a fixed support such as the frame of the device and with its other end resiliently connected to a motion-imparting device adapted to impart a motion to the belt in the longitudinal direction thereof. With this device the articles being processed are closely packed and suitably batched without damage thereto and with a constant number of articles being ejected for each ejection stroke.

3,790,026

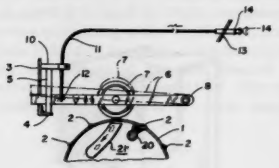
CORN PLANTER

Roger Neumeister, R.D. No. 1, Box 307, Ashland, Pa.

Filed Mar. 19, 1973, Ser. No. 342,465

Int. Cl. A01c *7/04*

U.S. Cl. 221—211 **2 Claims**



A seed planter of the type having an air pressured drum rotated about its axis by a trailer, which drum has a plurality of longitudinal rows of perforated pockets spaced evenly about the periphery of the drum. A plurality of separate rubber tired wheels are mounted on separate pivotal arms on the trailer frame for contacting selective peripheral rows of pockets denoting desired rows of seeds to be planted, whereby the blocked holes allow the seeds to be blown into discharge pipes leading to the furrows of the rows to be planted. Each arm is pivoted by a cable connected at one end to the arm and, at the other end to a control knob in the cabin of a tractor.

3,790,027

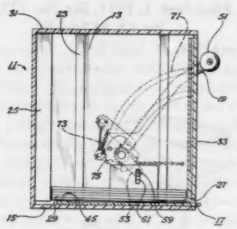
APPARATUS FOR DISPENSING FLAT ARTICLES

Carlton L. Barnhart, 3800 S. Hill Cir., Fort Worth, Tex.

Filed Oct. 11, 1972, Ser. No. 296,573

Int. Cl. B65g *59/06*

U.S. Cl. 221—274 **3 Claims**



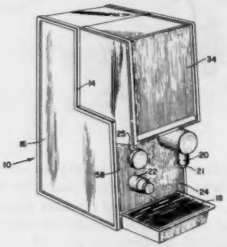
Apparatus for dispensing flat, relatively thin articles characterized by an article drawer that is slidably mounted on a stationary frame so as to be moved rearwardly to emplace a raised portion behind the bottom one of a stack of the articles in a container such that upon forward movement of the drawer the article is pulled forwardly so that its front end protrudes out of a discharge aperture, all responsive to operation of a manually operable handle that is connected with the drawer. A biasing means is provided for biasing the handle and article drawer toward their normal position. A plurality of the delineated elements may be employed for vending a plurality of different articles. When the apparatus having the plurality of respective elements are operated in a coin operated vending embodiment; a locking means, including a lock bar and respective linkages, requires and allows operation of only one lever and prevents operation of other levers, once operation of the one lever is begun. Also disclosed are specific structural features of respective embodiments.

3,790,028

HOT LIQUID DISPENSER

John A. Gardner, Jr., and Merle S. Brown, both of 195 Bear Hill Rd., Waltham, Mass.

Continuation-in-part of Ser. No. 887,671, Dec. 23, 1969, abandoned. This application Sept. 3, 1971, Ser. No. 177,597
Int. Cl. B67d 5/56
U.S. Cl. 222—129.4 28 Claims



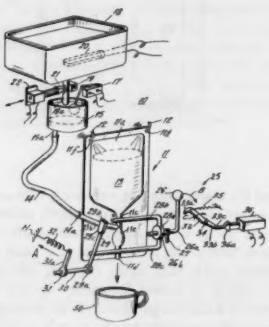
A hot chocolate dispenser having separate water and chocolate syrup circuits with a syrup and water control assembly connected to the circuits to enable the customer to select a large or small drink while maintaining a fixed ratio of water to syrup. A reverse flow sensor can be used in the dispenser to sense an out-of-syrup condition. The sensor indicates backflow of fluid and actuates circuitry to activate a suitable response.

3,790,029

APPARATUS FOR DISPENSING AND MIXING LIQUIDS

Wallace W. Ward, 28 Long Hill Ln., Chatham Twp., Chatham County, N.J.

Filed Sept. 1, 1971, Ser. No. 177,019
Int. Cl. B67d 5/56
U.S. Cl. 222—129.4 7 Claims



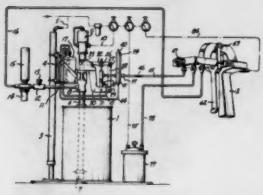
A bag having cavities and conduits is provided for the storage, selective passage and mixing of liquids. The sealed cavities contain liquids and the conduits are so connected as to cause the liquids to enter a mixing and metering pod from which the thus mixed liquids are dispensed. The arrangement is advantageously adapted for use in dispensing cold or hot drinks.

3,790,030

LIQUID RESIN SPRAY DISPENSERS

Frank E. Ives, 1862 Ives Ave., Kent, Wash.

Continuation-in-part of Ser. No. 129,375, March 30, 1971, abandoned, Continuation of Ser. No. 696,190, Jan. 8, 1968, abandoned. This application Nov. 8, 1971, Ser. No. 196,692
Int. Cl. B05b 7/04, 7/12
U.S. Cl. 222—135 13 Claims



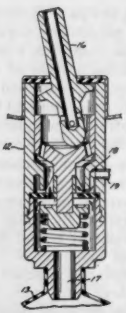
Resin and catalyst, respectively, in unaerated liquid form are pumped from containers by interconnected pumps having a common drive motor and delivered in accurate proportions to a trigger-operated dispensing gun. The pump motor is controlled by back pressure of liquid delivered by a pump so that, when resin and catalyst control valves in the gun body are opened simultaneously, lowering the pressure in the supply lines, operation of the pump motor will be initiated automatically. To enable the relatively viscous resin and the relatively fluid catalyst to be supplied to the gun body in accurate proportions of the order of one-hundred times as much resin as catalyst by weight despite the employment of long lines, such as thirty feet, the catalyst supply line is a tube having in it a core rod to provide a restricted annular passage. Resin and catalyst supplied separately to the gun body pass through a tortuous mixing passage in the gun body for the purpose of mixing the resin and catalyst thoroughly before passage of the mixture through the spray gun aperture. The small mixing chamber in the gun body can be cleaned by supplying to it a suitable solvent, such as acetone, from a container connected to the gun body mixing camber by a tube. If desired, chopped reinforcing strand material can be blown into the resin spray to be deposited with the resin.

3,790,031

METHOD OF CONTROL FOR AEROSOL DISPENSING AND A MULTIPHASE AEROSOL DISPENSER

Samuel Benjamin Prussin, 2126 Banyan Dr., and Victor Joel Pierce, 2040 Vestal, both of Los Angeles, Calif.

Filed Oct. 20, 1969, Ser. No. 867,533
Int. Cl. B67d 5/24
U.S. Cl. 222—136 4 Claims



A method for controlling flow of material from a multiple fluid aerosol product wherein a non-pressure producing fluid

is intentionally overfilled whereby flow from the aerosol container will cease when the pressure producing fluid is exhausted.

3,790,032

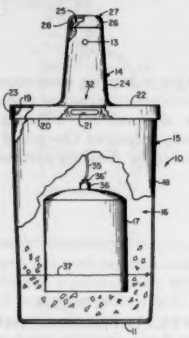
PARTY KEG BEER DISPENSER APPARATUS

Darell L. George, Midland, Tex., assignor to J. W. Henry, Odessa, Tex.

Filed Mar. 6, 1972, Ser. No. 232,172

Int. Cl. B67d *1/04*

U.S. Cl. 222—146 **1 Claim**



Party keg apparatus for cooling, housing, and dispensing draft or keg beer comprising a hollow main body within which a beer keg and ice may be housed so as to cool a considerable quantity of kegged beer. A removable tower structure has a platform included therewith which forms a closure member for the main body. The tower forms a chamber and also provides support means for a valve outlet which is disposed in overhanging relationship relative to a drain located in the platform.

A baffle plate located at the lower extremity of the interior of the tower enables a quantity of ice to be stored therewithin and about a flow line which flow connects the valve to the beer keg.

3,790,033

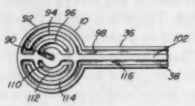
HOT CREAM DISPENSER

John T. Ciaffone, Bridgport, Conn., assignor to Warner Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 242,471, April 10, 1972, abandoned. This application Jan. 2, 1973, Ser. No. 320,429

Int. Cl. B67d *5/62*

U.S. Cl. 222—146 HA **9 Claims**



The specific disclosure provides a dispensing system including a heat exchange device for use in combination with aerosol containers having different creams therein. One type of aerosol container having a first cream, such as a cleansing cream, has a nozzle with an opening at the top thereof. Another type of container having a different cream, such as a moisturizing cream, has an opening formed in the side of the nozzle. The heat exchange device is positioned on either of the two types of nozzles, and an electrical heating unit applies heat to the top of the heat exchange device. The heat exchange device has a vertical center wall with a vertical cylindrical wall portion at the center thereof. An array of at least three concentric vertical walls are provided on each side of the center wall. Each array of concentric walls alternately has one end of the walls connected to and spaced from the center wall, and the other end of the walls spaced from and connected to the center wall to provide a channel in which cream flow changes direction to concentric flow paths at least twice as it flows outwardly from the cylindrical wall portion. One of the channels is formed for fluid communication with the nozzle having an opening at the top thereof, and the other of the channels is formed for fluid communication with the nozzle having an opening at the side thereof. The heat exchanger provides for dispensement of different heated creams by independent channels to avoid mixing of the products.

3,790,034

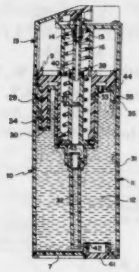
RECHARGEABLE SPRAYER

William Horvath, Chatham, N.J., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed Feb. 14, 1972, Ser. No. 226,204

Int. Cl. B67d *5/32*; **G01f** *11/04*

U.S. Cl. 222—153 **16 Claims**



A manually operated, hand-held liquid spraying device which includes a non-pressurized, refillable or non-refillable container, is disclosed. The sprayer is a completely contained device wherein an internal cam in one part of the device which is rotated, causes a displacement of a piston, a part of which is a cam follower. Piston displacement vacates a chamber which is simultaneously charged with liquid. The piston is moved as a result of the cammed motion against a responsor biasing it. The biased responsor generates a hydraulic pressure on the liquid now in the chamber vacated by the piston, since a check valve traps the liquid in the chamber. The liquid is released from the chamber by depressing a push button device, which action uncovers a port in an outlet conduit permitting liquid to flow from the chamber through the conduit and out through a flow connected nozzle in response to the responsor-urged piston moving down through the liquid in the chamber.

3,790,035

MANURE SPREADER WITH BED CLOSING GATES

Kelly P. Ryan, Blair, Nebr., assignor to Blair Manufacturing Co., Inc., Blair, Nebr.

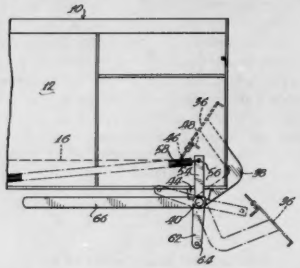
Filed Feb. 2, 1972, Ser. No. 222,864

Int. Cl. A01c *19/00*

U.S. Cl. 222—178 **2 Claims**

A manure spreader especially adapted for use in spreading relatively fluid manures. The exemplary embodiment comprises a box-like bed having an open end mounted on wheels and including a conveyor within the bed for conveying manure towards the open end thereof. In addition, a rotary spreading element is provided for spreading manure fed to the same by

the conveyor. A pivotally mounted gate is biased towards a position to close the bed with the biasing being sufficiently weak that upon operation of the conveyor or spreader, the pressure of manure impinging against the gate will cause the



same to automatically open to allow manure to be spread. The gate insures that relatively fluid manures cannot escape from the bed during movement of the spreader to a location whereat a spreading operation is to take place and prior to initiation of the spreading operation.

3,790,036

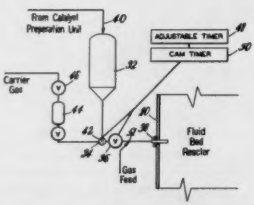
FLUID BED POLYMERIZATION CATALYST INJECTION SYSTEM

Adam Roy Miller, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,774

Int. Cl. B65g *69/06*

U.S. Cl. 222—194 **4 Claims**



Polymerization catalysts in the form of dry powders are continuously fed to a fluidized bed reactor under essentially plug-flow conditions by a sequential repetition of the steps of dispensing under controlled conditions, a desired quantity of catalyst from a catalyst supply source to a chamber which is alternately communicable with such supply source and the reaction zone of the fluidized bed reactor, isolating the dispensed catalyst from the catalyst supply source, exposing the dispensed catalyst to the reaction zone of the fluidized bed reactor and rapidly injecting the catalyst into the reaction zone with a carrier gas.

3,790,037

METERING GUN FOR DISPENSING PRECISELY MEASURED CHARGES OF FLUID

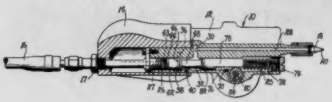
James C. Fletcher, Administrator of the National Aeronautics and Space Adiministration with respect to an invention of; Thomas A. Cook, 13681 Onkay Circle, Santa Ana, and Hans Scheibe, 13742 Claremont St., Westminister, both of Calif.

Filed June 28, 1972, Ser. No. 266,925

Int. Cl. G01f *11/02*

U.S. Cl. 222—324 **4 Claims**

A cyclically operable fluid dispenser particularly suited for use in dispensing precisely measured charges of potable water aboard spacecraft. The dispenser is characterized by a sealed housing adapted to be held within a crewman's palm and coupled with a pressurized source of potable water, a dispensing jet projected from the housing and configured to be received within a crewman's lips, an expansible measuring chamber for



measuring charges of drinking water received from the source, and a dispenser actuator including a lever extended from the housing to be digitated for initiating operational cycles, whereby precisely measured charges of potable water selectively are delivered for drinking purposes in a weightless environment.

3,790,038

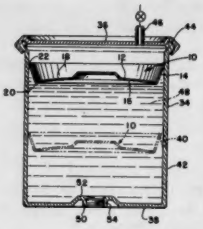
FOLLOW PLATE FOR DISPENSING MATERIAL

David E. Kifer, Parma, Ohio, assignor to Oatey, Co., Cleveland, Ohio

Filed Apr. 13, 1972, Ser. No. 243,616

Int. Cl. B67d *5/42*

U.S. Cl. 222—386 **3 Claims**



A follow plate particularly suitable for applying pressure on the flowable contents of a metal can or drum to force the material through an outlet opening which may be recessed within the lower end of the can to permit stacking of one can on top of another. The follow plate is made of a suitable flexible plastic material and preferably has a slightly conical face and a tapered flange about the periphery of the face including a free edge which engages the inner wall of the can. A hollow indentation may be provided in the face of the follow plate to receive the can outlet connection when the follow plate is against the lower end of the can. The conical shape of the face permits flexing of the face after engagement with the lower end of the can to force material disposed therebeneath toward the center and out through the outlet opening therein. The taper of the flange is desirably sufficient to permit the major diameter of the flange to ride over relatively large dents while avoiding contact between the dents and the minor flange diameter. Such relatively large taper of the flange also permits substantial tilting of the can and cocking of the follow plate without causing the follow plate to become wedged against movement within the can.

3,790,039

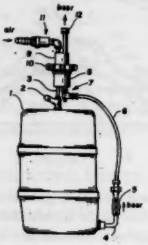
KEG TAPPING ASSEMBLY

Homer R. Zucconi, 421 Speer St. N., Belle Vernon, Pa.

Continuation-in-part of Ser. No. 190,796, Oct. 20, 1971. This application Dec. 29, 1972, Ser. No. 319,454. The portion of the term of this patent subsequent to Feb. 27, 1990, has been disclaimed.

Int. Cl. B65d *83/00*

U.S. Cl. 222—394 3 Claims



A keg tapping assembly comprising a tavern unit having two prongs which are sleeve-like with tapered ends to unseat the two spring closed valves of a permanently attached keg unit detachably connected to the top central hole of a keg, upon insertion into the keg unit. The invention embodies an attachment having two bores through which said prongs are detachably fitted, each bore including a one-way valve. One bore is directly connected to a tap rod insertable in the top center opening,- and the other bore is connected to a valved outlet connection at the bottom of a keg. By simply unplugging the tavern unit from the keg unit and plugging it into said attachment it is selectively usable on either a conventional single connection tap or on the older double connection tap. A one-way valve is also provided in the air connection of the tavern unit.

3,790,040

WORM METERING DEVICE WITH SHUT-OFF MECHANISM

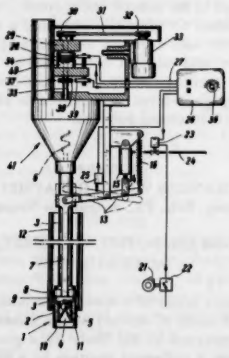
Siegmund Bahr, Stuttgart-Uhlbach, and Walter Saur, Korntal, both of Germany, assignors to Fr. Hesser Maschinenfabrik AG, Stuttgart, Germany

Filed Feb. 24, 1972, Ser. No. 228,900

Claims priority, application Germany, Feb. 25, 1971, P 21 08 911.2

Int. Cl. G01f *11/20*

U.S. Cl. 222—413 8 Claims



An apparatus and method for metering material, such as in container filling operations, which have closure means in the form of a first movable member, preferably of an annular configuration, operating in conjunction with second closure means in the form of a conically shaped closure element which the first closure means is adapted to abut in mating sealing engagement to prevent discharge of material.

ERRATUM

For Class 222—52 see:
Patent No. 3,790,042

ERRATUM

For Class 222—390 see:
Patent No. 3,790,048

3,790,041

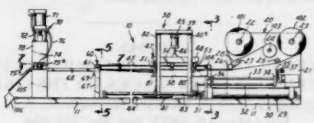
APPARATUS FOR PRODUCING PREFABRICATED BOWS

Walter C. Pearson, St. Paul; Edward R. Quinn, Burnsville, and Dorman N. Thompson, North St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 320, Jan. 2, 1970, Pat. No. 3,637,455, and a continuation-in-part of Ser. No. 791,992, Jan. 17, 1969, abandoned. This application Apr. 15, 1971, Ser. No. 134,130

Int. Cl. A41h *43/00*; D04d *7/10*

U.S. Cl. 223—46 4 Claims



Apparatus for mechanically fabricating prefabricated bow forms from two strips of decorative ribbon material and including a drawstring partially bonded to the ribbon, said apparatus comprising a ribbon and drawstring supply, motor means, a ribbon bonding assembly for bonding said ribbon materials together at spaced points, a ribbon advancing means and a ribbon cut-off means. A simple method of forming decorative bows from the prefabricated bow forms is also disclosed, said method comprising accumulating the bonded areas of said prefabricated bow forms one upon another, simultaneously forming loops of ribbon on either side of said bonded areas, by means of the drawstring.

3,790,042

APPARATUS FOR REGULATING THE AMOUNT OF LIQUID ADMINISTERED PER UNIT TIME

James B. McCormick, Hinsdale, and Shunjiro Ohba, Chicago, both of Ill., assignors to Pelam Inc., Hinsdale, Ill.

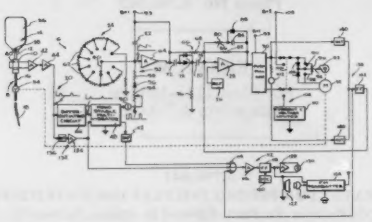
Filed Sept. 15, 1970, Ser. No. 72,313

Int. Cl. B67d *5/08*

U.S. Cl. 222—52 12 Claims

A regulating apparatus for regulating the amount of liquid administered per unit time to a recipient by an administering apparatus. The administering apparatus includes a drip chamber connected by means of a delivery tube to a supply of drops of liquid and by a second delivery tube to a device for transferring the liquid to a recipient. The regulating apparatus comprises a first means which senses the drops of liquid passing through the drip chamber and which produces pulses representing the number of drops. The pulses produced by the sensing means are accumulated in a second means which produces a first signal related to the number of pulses received

per unit time. The amplitude of the first signal is changed by a third means at a rate related to a preselected drip rate. A fourth means is provided for generating a reference signal which is compared in a fifth means to the changed amplitude of the first signal, the fifth means producing the third signal related to the difference between the signals. The third signal is fed to a sixth means which supplies the proper current to a bi-directional motor to drive the motor in one direction when the changed first signal is less than the reference signal and to



drive the motor in the opposite direction when the changed signal is greater than the reference signal. The bi-directional motor is connected to a valve or clamp which is disposed on the delivery tube so as to vary the amount of liquid flowing through the tube. Thus, if the drip rate becomes greater than the preselected rate, the valve is moved toward a closed position by the motor to reduce the drip rate, while if the drip rate is less than the preselected rate, the valve is moved toward the open position to increase the drip rate.

3,790,043

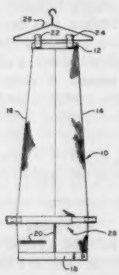
METHOD AND APPARATUS FOR REMOVING WRINKLES FROM SLACKS, OR THE LIKE

Elmer Ray Hagen, 230 W. Genesee St., Auburn, N.Y.

Filed May 19, 1972, Ser. No. 255,106

Int. Cl. D06c *15/00*

U.S. Cl. 223—61 **1 Claim**



Structure for attachment to slacks, or other such garments, tending to remove wrinkles and restore creases by exerting forces on the slacks both transverse and parallel to the creases. The transverse force is exerted by attaching the structure to the slacks at the front and rear at points aligned with the creases in the area between the waistband and crotch and maintaining a stretching force. The longitudinal force is provided by suspending the slacks freely from the cuffs with the structure attached, whereby the weight of the structure exerts a longitudinal force along the cuffs. The structure comprises a pair of telescoping rods with spring clips at the remote ends and detent means for maintaining the desired spacing of the clips to exert the transverse stretching force on the slacks.

3,790,044

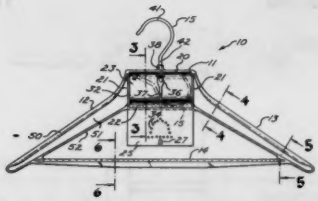
GARMENT HANGERS

Rocco Verdile, 4107 Ridgeview Rd., Cleveland, Ohio

Filed Sept. 28, 1972, Ser. No. 292,876

Int. Cl. A47j *51/10*

U.S. Cl. 223—86 **3 Claims**



Thereis disclosed herein a garment hanger having a compartment for moth crystals, deodorant tablets, and the like and hollow arms especially formed for efficiently dispersing the fumes into the garment. A crossbar of the hanger is provided with transversely projecting pegs for retaining a garment placed thereover.

3,790,045

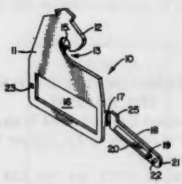
TIE HOLDER

Yehoshua Rigel, 21, Moshe Sharet St., Tel-Aviv, and Eduard Singer, 21, Deganim St., Ramat Gan, both of Israel

Filed Aug. 11, 1972, Ser. No. 279,804

Int. Cl. A47j *51/96*

U.S. Cl. 223—87 **6 Claims**



A tie holder comprising a body portion having hook means at the upper end thereof extending about a passage and an opening formed in the bottom end thereof, a movable tie support arm adapted to span said opening, a restraining strip protruding from said arm and adapted to project into said opening when said support arm is in its closed position spanning said opening, and means on said arm and said body adapted to engage to form a disengageable closure when said support arm is in its closed position.

3,790,046

COAT HANGER WITH COLLAPSIBLE HOOK

James L. Rooney, Erie, Pa., assignor to Niagara Plastics, Inc., Eria, Pa.

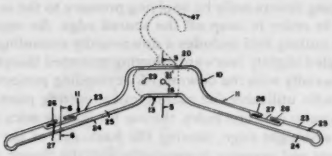
Filed Jan. 28, 1972, Ser. No. 221,510

Int. Cl. A47j *51/08*

U.S. Cl. 223—92 **1 Claim**

A coat hanger made of a hook and a body. The hook and body are both made of molded plastic material. The hook is swingably connected to the body by a pivot member and swingable from a collapsed position to a use position. The pivot member is integrally connected to the body and extends through a hole in the hook and a detent on the hook engages

the recess in the body when the hook is in use position. The pivot member has a head made up of spaced flangelike members that overlie the part of the body and the pivot has a hole through it so that the head members can be deflected toward each other and spread after the hook is installed on the body.



3,790,047

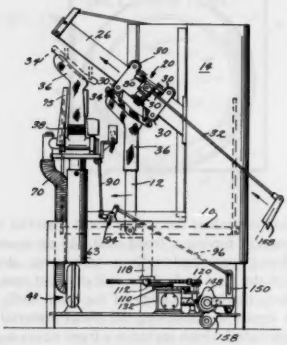
APPARATUS FOR TREATING AND TRANSFERRING ARTICLES OF HOSIERY, OR OTHER ARTICLES OF APPAREL, FROM BOARDING FORMS ONTO A COLLECTING SURFACE

J. T. Laxson, Paducah, Ky., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 90,001, Nov. 16, 1970, abandoned. This application Oct. 6, 1971, Ser. No. 186,997

Int. Cl. A47j *51/06*

U.S. Cl. 223—112 **6 Claims**



Apparatus for treating and transferring articles of apparel includes a rotating support means which carries a plurality of boarding forms that are vertically disposed for carrying such articles into and out of a treating chamber. After treatment, the articles are removed from the boarding forms and received onto a foraminous surface of a transferring means for being subsequently stacked or collected on a flat surface. The transfer means operates on an air pressure differential principle, and mechanisms are provided for coordinating the treating, removing, and transferring of each article. During transfer of the article, there is an automatic cooling of the article by a flow of air created by the transferring means.

3,790,048

INCREMENTAL DOSE DISPENSER

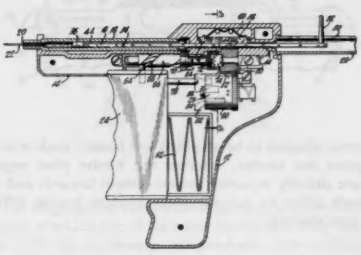
Robert A. Luciano, Warren; Chester M. Zmijewski, Martinsville, and Gustav V. Borden, Warren, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed July 28, 1972, Ser. No. 276,196

Int. Cl. A61m *5/22*

U.S. Cl. 222—390 **6 Claims**

A dispenser is provided for use in conjunction with syringes and is capable of accurate, rapid dispensing of small incremental doses and rapid and convenient refilling of the syringe. The dispenser comprises an elongated plunger for engaging and advancing the piston of the syringe to expell liquid doses therefrom. The plunger is threaded along at least a portion of its longitudinal, peripheral surface. A drive wheel is provided for advancing the plunger; the drive wheel having its peripheral surface divided into alternate threaded sections and longitudinal separating grooves. The threaded sections engage the threaded portions of the plunger advancing the same to rapidly dispense the incremental doses. The longitudinal grooves provide a clearance between the plunger and drive wheel thereby leaving the plunger disengaged for rapid refilling of the syringe.



3,790,049

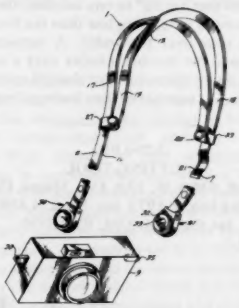
ADJUSTABLE CARRYING STRAP

August Bohanec, 44 N. Mentor Ave., Pasadena, Calif.

Filed May 8, 1972, Ser. No. 250,971

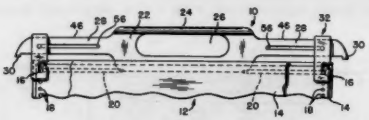
Int. Cl. A45c *11/38*

U.S. Cl. 224—45 P **5 Claims**



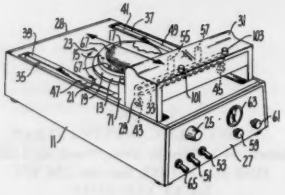
A pair of straps are arranged to form a carrying handle having relatively narrow opposite ends for connection to an article such as a camera. Each strap has a portion frictionally embraced by a loop secured to the other so as to space the straps apart in substantially edge-to-edge relationship so that the handle has a relatively wide intermediate portion. Each strap is slidable through the loop embracing it for adjusting the length of the handle.

3,790,050
ADJUSTABLE BINDER HANDLE
John L. Sullivan, New York, N.Y., assignor to The Mead Corporation, Dayton, Ohio
Filed June 8, 1972, Ser. No. 260,968
Int. Cl. B42f *15/00*
U.S. Cl. 224—45 P **2 Claims**



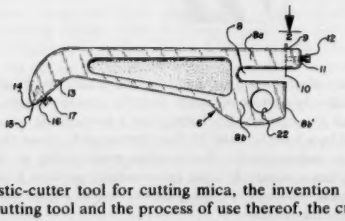
A carrier adapted to be attached to a binder, such as a computer print out binder, wherein the binder post engaging hooks are slidably mounted for movement towards and away from each other to accommodate binders having different binder post spacings.

3,790,051
SEMICONDUCTOR WAFER FRACTURING TECHNIQUE EMPLOYING A PRESSURE CONTROLLED ROLLER
Arthur H. Moore, Fillmore, Calif., assignor to Radiant Energy Systems, Inc., Newbury Park, Calif.
Filed Sept. 7, 1971, Ser. No. 178,275
Int. Cl. B26f *3/00*
U.S. Cl. 225—1 **15 Claims**



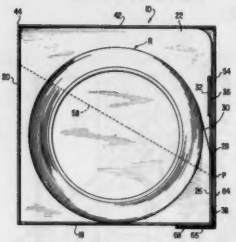
A technique for fracturing a scribed wafer into its individual electronic circuit dice wherein a roller is passed over the wafer two times in paths that are 90° to one another, the force of the roll during the second pass being less than the force of the roll during the first pass over the wafer. A vacuum-driven apparatus is disclosed for moving a roller over a scribed wafer and maintaining an optimum force of the roll against the wafer in order to reduce the number of dice having chipped edges.

3,790,052
CUTTING TOOL
Louis Robert Toll, 930 N.W. 27th Ave., Miami, Fla.
Filed Feb. 8, 1972, Ser. No. 224,430
Int. Cl. B26b *3/08;* **B26f** *3/00*
U.S. Cl. 225—2 **6 Claims**



A plastic-cutter tool for cutting mica, the invention being both a cutting tool and the process of use thereof, the cutting tool having a butt jaw end with a slot thereabove and a downwardly held cutting needle, the process including the placing of the butt jaw-end of the tool against the table edge, scoring the mica by lateral movement to and fro several times, then snapping downwardly by applying pressure to the scribed strip-edge in order to snap off the scored edge. An opposite end of the cutting tool includes a downwardly extending projection angled slightly rearwardly having mounted therein extending coaxially with the downwardly extending projection a cutting needle utilizable for cutting mica, cutting plastic, or cutting irregular cuts and holes, the use for cutting mica being by use of a straight edge, scoring the back side of the mica several times and pressing downwardly with the thumb at the cuts with the other hand snapping the mica upwardly, while when cutting plastic the same procedure is followed except snapping downwardly, while using a pattern or a hole tablet to produce irregular cuts and/or holes by scoring several times then pushing from the face to the back of the scored material.

3,790,053
DISPENSING CONTAINER FOR ROLLED SHEET MATERIAL
Antoinette Schiano, and Rosemary Schiano, both of 261 76th St., Brooklyn, N.Y.
Filed Dec. 30, 1971, Ser. No. 214,180
Int. Cl. B26f *3/02*
U.S. Cl. 225—48 **5 Claims**

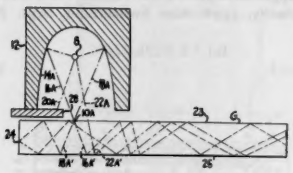


A dispensing container for rolled sheet material includes a receptacle portion having a front wall and an open top, the front wall being provided with a transverse slot therein through which the free end of the roll of sheet material is issued and, along the bottom edge of the front wall, there is a cutting edge device for severing the sheet material. A cover assembly is provided which includes a front cover wall portion which partially covers the front wall of the receptacle portion and overlies the slot to sandwich the free end portion of the sheet material between it and the front wall of the receptacle portion and, prior to use, the cover assembly is provided with a sealing and protecting extension joined to the front cover wall portion of the cover assembly along a line of perforations and which extends downwardly and below the cutting edge member and is adhesively secured to the underside of the package. The front wall member of the receptacle portion is provided with a reinforced upper free edge portion immediately above the slot.

3,790,054
DIRECTIONAL CONTROL FOR THERMAL SEVERING OF GLASS
John R. Dahlberg, Jeannette; James L. Oravitz, Jr., Cheswick, and Edmund R. Michalik, West Mifflin, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Division of Ser. No. 72,353, Sept. 15, 1970, Pat. No. 3,709,414. This application June 21, 1972, Ser. No. 265,081
Int. Cl. B26f *3/00*
U.S. Cl. 225—93.5 **6 Claims**

This invention relates to non-contact thermal severing of glass and includes methods and apparatus for altering at least

some of the radiation from a thermal source so that a temperature profile that would ordinarily otherwise tend to be asymmetrical becomes symmetrical about an intended path of cut. The problem of asymmetrical temperature profiles occurs, for



example, in non-bisecting cuts. The cut is completed either by continuing with the application of radiant heat until a tensile stress of about 1,000 pounds per square inch is generated within the glass, or by applying a bending moment about the thermal score.

3,790,055

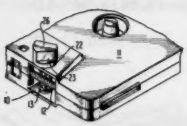
MOTION CONTROL DEVICE

John C. Sims, Jr., Sudbury, Mass., assignor to New England Research Associates, Inc., Bedford, Mass.

Filed Jan. 11, 1973, Ser. No. 322,808

Int. Cl. B65h *17/44*

U.S. Cl. 226—174 **5 Claims**



A clutch or motion control device for quickly controlling with great accuracy the motion of the tape in a cassette when inserted in a cassette player-recorder unit. The device is a hollow, elongated member mounted for rotation about its longitudinal axis in the cassette adjacent the tape such that the driving capstan of the cassette player-recorder unit is retained within the cavity of the hollow member. A portion of the sidewall of the hollow member is cut away to expose the cavity and bring the tape into contact with the driving capstan when the hollow member is in one rotative position. In a second rotative position, the boundry of the unremoved sidewall portion of the hollow member separates the tape from the rotating capstan.

3,790,056

METHOD AND APPARATUS FOR EQUALIZING LONGITUDINAL VARIATIONS IN THE RUNNING OF A WEB UNDER TENSION

Willi J. Schmidt, Hahn/Taunus; Wolfgang Kornelli, and Eberhard Werner, both of Wiesbaden-Biebrich, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

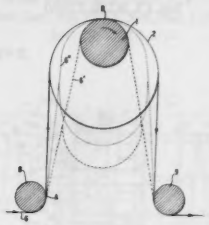
Continuation-in-part of Ser. No. 825,658, May 19, 1969, abandoned. This application Oct. 22, 1970, Ser. No. 83,218

Claims priority, application Germany, May 21, 1968, 1774310

Int. Cl. B65h *23/00*

U.S. Cl. 226—195 **5 Claims**

This invention relates to a method and apparatus for equalizing longitudinal variations in the running of a web under tension, wherein the web is passed over a support therefor which is at least partially oscillatable in accordance



with the longitudinal variations of the web and the oscillatable portions of which are of such low inertia that they oscillate in phase with the oscillating web, and the non-oscillating portions of the web are supported.

3,790,057

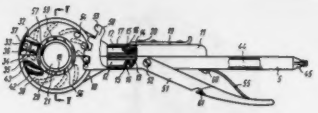
SURGICAL INSTRUMENT FOR SUTURING BLOOD VESSELS WITH U-SHAPED STAPLES

Mikhail Mikhailovich Razgulov, ulitsa Trudovaya, 1-a, kv. 18, Elektrostal Moscovskoi Oblasti; Georgy Vasilievich Astafiev, Rizhsky proezd, 7, kv. 108, and Ivan Alexandrovich Korolkov, Polyarnaya ulitsa, 52, korpus 2, kv. 174, both of Moscow, all of U.S.S.R.

Filed Jan. 28, 1972, Ser. No. 221,656

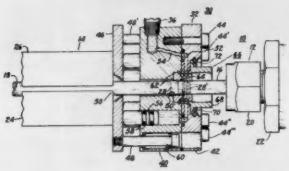
Int. Cl. A61b *17/12*

U.S. Cl. 227—19 **4 Claims**



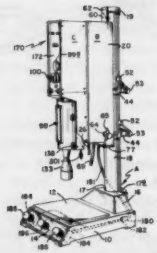
A surgical instrument for suturing blood vessels with U-shaped staples, has two supporting semibushes whose cylindrical surface has depressions for staples to be deformed, and two staple semibushes that embrace the supporting semibushes from outside so that an annular gap is left therebetween to accommodate the walls of the blood vessel being sutured. The staple semibushes are provided with radial slots, wherein staple-magazines are movably mounted; the magazines have staple recesses and staple ejectors located inside said magazines. The instrument is provided with mechanical actuators to impart radial motion to the magazines and staple ejectors. The end of a blood vessel is everted as a cuff on the assembled supporting semibushes and on the blood-vessel end so everted, the other end of the blood vessel to be sutured on is disposed in overlapping relation, whereupon the staple semibushes are assembled embracing the overlapping region of the blood-vessel ends. Suturing is performed in a single motion by causing U-shaped staples to eject from the staple magazines. The ejected staples penetrate the overlapping walls of the blood-vessel and get deformed by impinging against the depressions on the supporting semibushes. Suturing performed, the semibushes are disassembled and the surgical instrument withdrawn.

3,790,058
APPARATUS FOR SHEARING WELD FLASH
Robert L. Filkorn, New Philadelphia, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed May 12, 1972, Ser. No. 252,638
Int. Cl. B23k 27/00
U.S. Cl. 228—2 5 Claims



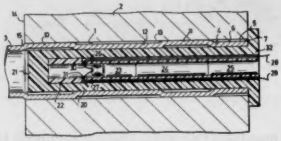
The present invention deals with a process and apparatus for removing the weld flash from two workpieces that have been butt-welded together. More particularly, the weld flash is removed with a shearing action that is commenced before the weld has cooled sufficiently to introduce any further hardening of the workpieces. A particular shearing mechanism is employed which pre-positions the shearing tool adjacent to the weld location to facilitate the desired objective. A concentric shearing tool is also employed in the flash removal mechanism to remove all the flash in a single action.

3,790,059
ULTRASONIC APPARATUS
Stanley E. Jacke, Ridgefield, and John Jugler, Danbury, both of Conn., assignors to Branson Instruments, Incorporated, Stamford, Conn.
Continuation of Ser. No. 140,700, May 6, 1971, abandoned.
This application Feb. 14, 1973, Ser. No. 332,356
Int. Cl. B23k 1/06
U.S. Cl. 228—1 14 Claims



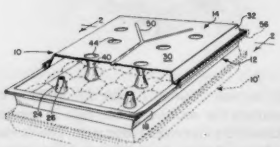
An ultrasonic apparatus for welding or assembling thermoplastic parts is constructed in modular fashion. The apparatus comprises a base having platform adapted to receive a workpiece, a vertical post extending from the base, a first enclosure means containing a power supply, and a second enclosure means containing motive means for an electro-acoustic converter. Both enclosure means, in modular fashion, are connected to each other and supported from the post at an adjustable height from the platform. The base is provided with pushbutton means. The construction shown eliminates the separate power supply and interconnecting cabling. Also, the converter is mounted for quick electrical disconnect and mechanical displacement.

3,790,060
APPARATUS FOR MOUNTING A PIPE IN A PERFORATED PLATE
Rene T. Feiss, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland
Division of Ser. No. 69,703, Sept. 4, 1970, Pat. No. 3,698,067.
This application June 23, 1972, Ser. No. 265,606
Claims priority, application Switzerland, Sept. 23, 1969, 14236/69
Int. Cl. B23k 21/00
U.S. Cl. 228—3 11 Claims



The pipe is fitted with at least a pair of explosive members, one of which serves to weld the pipe to the perforated plate while the other serves to expand the pipe into bearing contact with the plate. The detonation of the two members takes place in the same operation. A third explosive member can also be fitted in the pipe for welding the pipe to an opposite side of the plate.

3,790,061
REUSABLE CONTAINER
James M. Pignato, 5819 N. Artesian, Chicago, Ill.
Filed Apr. 16, 1971, Ser. No. 134,666
Int. Cl. B65d 1/00, 85/00
U.S. Cl. 229—2.5 3 Claims

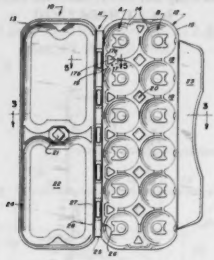


A reusable open tray-like container, preferably plastic, for use with one or more similar containers to provide a lower and an upper portion forming a relatively large volume closed container providing a substantially sealed space for shipment of commestibles, all of said tray containers being nestable for compact storage. Each of said tray containers further including centrally located support means which also serve as locating means for preventing lateral movement between two opposed tray portions or containers. Additionally each tray container includes lateral seal means for sealing two mating positions forming the entire closed container.

3,790,062
CARTON CONSTRUCTION
James W. Boyd, Crown Point, Ind., assignor to Packaging Corporation of America, Evanston, Ill.
Filed Sept. 27, 1971, Ser. No. 183,938
Int. Cl. B65d 85/32
U.S. Cl. 229—2.5 7 Claims

A carton is provided wherein the cover thereof is connected to the tray by an elongated hinge panel. One elongated edge of the panel is connected to the tray and forms a first hinge-line and the opposite elongated edge of the panel is connected to the cover and forms a second hinge-line. The first hinge-line has greater flexibility than the second hinge-line. Complemen-

tal means are formed on said tray and hinge panel whereby, upon closing of the carton, the cover and hinge panel initially move as a unit about the first hinge-line as an axis through a



predetermined arc and then the cover moves relative to the hinge panel about the second hinge-line as an axis through a further predetermined arc into an overlying closed position with respect to the tray.

3,790,063

CARTON FOR FRAGILE OBJECTS

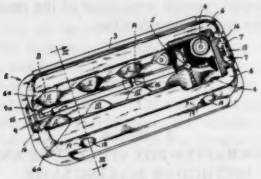
Bent Moller, Lyngby, Denmark, assignor to Aktieselskabet Brodrene Hartmann, Lyngby, Denmark

Filed Nov. 2, 1972, Ser. No. 303,200

Claims priority, application Denmark, Nov. 17, 1971, 5650/71

Int. Cl. B65d *85/32*

U.S. Cl. 229—29 M **5 Claims**



An article-revealing carton for fragile objects, particularly eggs, consisting of a container section and a cover section hinged thereto, said container section having a plurality of article-receiving compartments arranged in at least two parallel rows and upwardly extending projections located between said rows of compartments, said cover section having at least two upwardly projecting gable portions extending parallel with the rows of compartments and between two neighbouring gable portions a recessed roof portion interconnecting the lowermost edges of opposed sides of the neighbouring gable portions and moreover there is provided a number of apertures corresponding to the compartments in the container section, said apertures being formed in the recessed roof portion and in the sides of the gable portions adjoining thereto and being arranged so as to coincide with the respective compartments in the container section when the carton is closed, and wherein the recessed roof portion has a downwardly projecting rib extending in the longitudinal direction of the roof portion and being shaped as a groove with at least one denesting projection provided therein, the rib and the projections of the container section being so formed and arranged relative to each other that the rib rests on the top of the projections when the carton is closed.

3,790,064

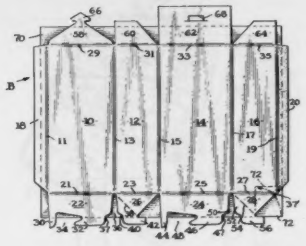
SIMULATED PREWRAP CARTON AND AUTOMATIC LOCK BOTTOM ARRANGEMENT

Robert G. Kramer, Cincinnati, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed Jan. 12, 1972, Ser. No. 217,100

Int. Cl. B65d *5/10*

U.S. Cl. 229—39 R **7 Claims**



A carton member erectable from a collapsed condition comprising a bottom construction which automatically unfolds itself and locks the carton in erected condition on application of force to opposite folded edges thereof and a blank for assembly of such a carton member. The carton is provided with outer wrapping material adhered to the outer surfaces of the blank to afford a simulated gift wrapped package when the carton member is in erected condition.

3,790,065

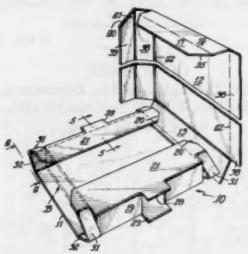
CUSHIONED FOLDER

John L. Carpenter, Anderson, Ind., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 17, 1972, Ser. No. 218,066

Int. Cl. B65d *5/06*

U.S. Cl. 229—40 **3 Claims**



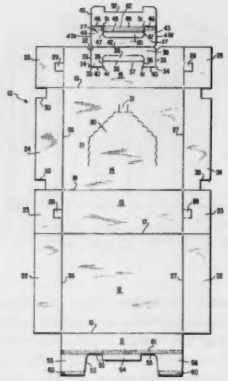
A cushioned folder for a flat article such as a book or the like is provided with protecting cells on the four boundaries thereof. The folder is formed from a cut and scored blank of paperboard or the like to provide foldably interconnected major and minor walls connected as a tubular sleeve. A cavity is defined in the folder for a flat article and consists of first and second flaps connected to opposite sides of one of the major walls, the flaps being foldable into position to embrace opposite sides of the flat article. The first and second flaps partly define cells for protecting opposite ends and sides of the article, one of the major walls and one of the flaps defining extensions upon folding of the flaps to position, these extensions being embraced by closure flaps which are folded to define a pair of opposing protecting cells. The first and second flaps and one of said major walls are slit to provide tab elements cooperating with the minor walls for defining protecting cells for the ends of the article.

3,790,066

FOLDING CARTON AND BLANK THEREFOR

Edward Stephen Malinowski, Yorkville, Ill., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Mar. 27, 1972, Ser. No. 238,556
Int. Cl. B65d 5/46
U.S. Cl. 229—52 B 14 Claims



A carton blank and a carton formed therefrom, said carton having a bottom wall, a pair of opposed side wall panels and a pair of top wall panels. A folding double handle having a U-shaped opening therein extends from one of said top wall panels. The other top wall panel overlaps and is secured to said one top panel and is provided with a recess for receiving the handle. A tongue extending from the base of the recess overlaps tongues extending from each side of the base of the handle. The end of a handle element in one carton blank nests within the recess in the top panel of another blank to conserve material when forming a plurality of blanks from a paperboard sheet.

3,790,067

CONTAINER

Stanley C. Scheier, 21 Maple Leaf Ln., Doylestown, Pa.

Filed Dec. 4, 1970, Ser. No. 95,140
Int. Cl. B65d 33/00
U.S. Cl. 229—55 6 Claims

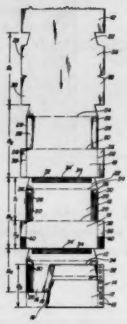
A container having an inner layer of water-insoluble polymeric material and an outer layer of a water soluble polymeric material. The outer layer comprises the load-bearing member and the inner layer is sufficiently thin to be shredded under normal atmospheric forces or by the weight of material in the container.

3,790,068

CONTINUOUS FORM ENVELOPE ASSEMBLY

William Stutz, Springfield, Mass., assignor to United States Envelope Company, Springfield, Mass.

Filed May 20, 1971, Ser. No. 145,412
Int. Cl. B65d 27/10
U.S. Cl. 229—69 17 Claims



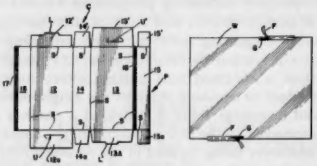
A continuous form envelope assembly made by cutting, folding and joining associated portions of a single web of sheet material and comprising a longitudinal series of connected envelopes arranged in shingled or overlapping relation and further connected together by a pair of longitudinally extending marginal carrier strips. Each envelope in the series has a sufficient portion of the front panel thereof exposed to permit a name and address to be printed thereon when the assembly is fed through a computer-printer or the like. Lines of weakening on the assembly permit separation of the envelopes from the carrier strips and from each other.

3,790,069

UNIQUE PREWRAPPED BOX STRUCTURE AND UNIQUE METHOD OF MAKING SAME

Armand E. Straccamore, 216 Summer St., Buffalo, N.Y.

Filed May 17, 1972, Ser. No. 254,311
Int. Cl. B65d 65/14
U.S. Cl. 229—87 R 7 Claims

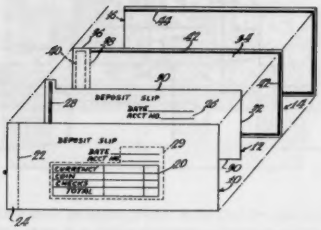


The prewrapped box includes a separate ornamental wrapper permanently affixed externally thereon. The method is directed to the permanent fixing of the separate ornamental wrapper on the box blank; the collapsed box with wrapper thereon; said ornamental wrapper being on the box as sold and used.

3,790,070
COMBINATION RECORD AND ENVELOPE ASSEMBLY WITH SEVERABLE RECEIPT

David H. Schnitzer, Arlington Heights, and Howard K. Absler, Skokie, both of Ill., assignors to Uarco Incorporated, Barrington, Ill.

Filed July 17, 1972, Ser. No. 272,361
Int. Cl. B65d *27/00*
U.S. Cl. 229—92.8 5 Claims

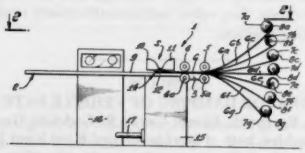


A combination record, envelope and severable receipt structure defined by four sheets of paper or the like and for use in operations such as banking operations wherein a deposit or the like may be inserted in and sealed within the envelope with the record sheet remaining with the envelope to record the deposit and the receipt sheet being severed from the structure to be retained by the depositor. Two separate sheets, one longer than the other, define an envelope, the longer sheet including an envelope flap with adhesive means thereon for sealing against the shorter sheet. Secured to one side of such envelope structure is an indicia bearing record sheet having a line of perforation adjacent one marginal edge. A receipt sheet, having indicia on one side thereof is secured to the rear side of the record sheet and has marginal edges recessed from corresponding marginal edges of the record sheet. The latter is also secured to the envelope structure in such a way that the marginal edges of the receipt sheet are free from the resulting configuration so that, by breaking the structure along the line of perforation, the receipt sheet may be severed therefrom for retention by the person using the structure.

3,790,071
FABRIC CUTTER AND METHOD

Estephan Der Estephanian, 2452 Boulder Rd., Altadena, Calif.

Filed Jan. 20, 1972, Ser. No. 219,317
Int. Cl. B26d *3/00*; A41h *43/00*
U.S. Cl. 234—1 20 Claims

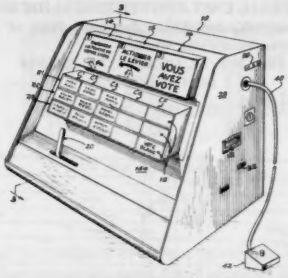


Fabric cutting by means of multiple individually and independently actuable cutting blades selectively operable to sequentially effect pinking cuts in successive increments of fabric, to progressively cut a piece therefrom according to a predetermined pattern.

3,790,072
VOTING MACHINE

Michael Terrance Moldovan, Jr., Lakewood, N.Y., assignor to AVM Corporation, Jamestown, N.Y.

Filed June 28, 1971, Ser. No. 157,366
Int. Cl. G07c *13/00*
U.S. Cl. 235—54 R 1 Claim

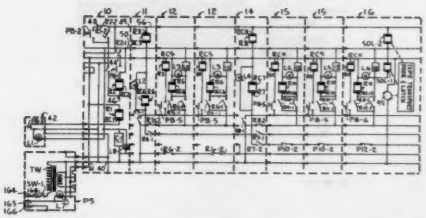


An improved mechanical voting machine embodying means facilitating the making of a single selection from a plurality of available ballot choices; such choices being presented as indicia carried on the faces of a plurality of voter operated push button selectors. The machine features an election official operated "entrance" control; means for preventing the voter from causing the machine to record more than one vote, while requiring that such vote be cast before he leaves the machine; and means for printing the election results on required numbers of print out sheets.

3,790,073
VOTING MACHINE

Roy A. Martin, and Clarence E. Pittman, both of Atlanta, Ga., assignors to Lectra Data, Inc., Atlanta, Ga.

Division of Ser. No. 755,688, Aug. 27, 1968, abandoned. This application Apr. 28, 1972, Ser. No. 248,657
Int. Cl. G07c *13/00*
U.S. Cl. 235—54 F 5 Claims



Apparatus for selectively producing electrical pulses representative of a particular selection made by the operator of the apparatus. The apparatus is disclosed in the form of a voting machine built up of modular components which fit together to form any of a plurality of different voting arrangements. The voting machine is substantially tamper-proof and has the following basic components: an input module, a frame assembly, a first control module, a first vote module, a second control module, a second vote module, a terminal module, a write-in module, a slave input module, and a third control module. The modules may be placed together in selected fashion to define a voting machine for voting in any type of political race and which will prevent overvoting. The different modules fit together in such manner that they cannot be

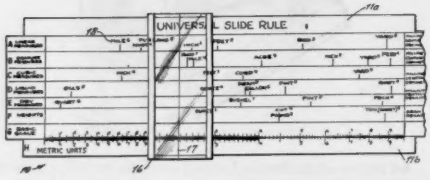
separated without a key to unlock the same, thereby reducing the possibility of tampering with the election results. Moreover, each module is constructed in such manner that the module may be checked prior to assembly of the voting machine to insure proper functioning of the module once it is assembled.

3,790,074

UNIVERSAL UNIT-CONVERTING SLIDE RULE

Rudolph Zemanek, and Elena Zemanek, both of Box 297, South International Falls, Minn.

Filed Apr. 12, 1973, Ser. No. 350,314
Int. Cl. G06c *3/00*
U.S. Cl. 235—89 R **2 Claims**



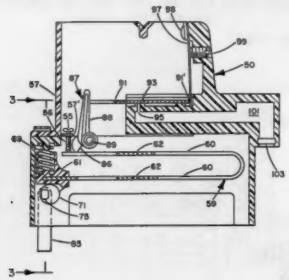
This is a slide rule for quickly converting from one unit of measure to another and includes scale indicia for accurately and quickly determining the position of the decimal point in the computed answer.

3,790,075

THERMOSTAT ASSEMBLY

Ernest Rifkin, Dewitt, N.Y., and Richard C. Dreibelbis, Fair Lawn, N.J., assignors to Carrier Corporation, Syracuse, N.Y.

Filed July 12, 1972, Ser. No. 270,914
Int. Cl. F24f *3/06*
U.S. Cl. 236—49 **5 Claims**



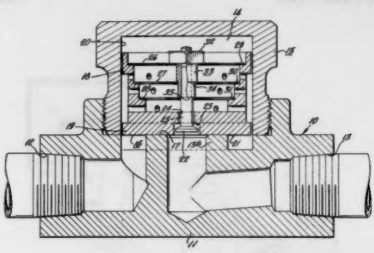
A ceiling air terminal serving as part of an air conditioning system for a building and adapted to discharge conditioned air into an area to be treated. The terminal is provided with a bleed-type thermostat employing a bimetallic element movable in response to temperature variations in the air passing over the element from the area served by the ceiling terminal. The bimetallic element is adjustably supported for movement relative to the housing of the thermostat. The adjustable support includes a calibration member formed of a thermoplastic material. The calibration member journals a control rod. The position of the control rod is selectively varied to regulate the operation of the terminal to obtain a desired temperature in the area. A resilient spring member cooperates with the calibration member so the member is maintained in intimate contact with the control rod, thereby preventing the rod from self rotating.

3,790,076

PILOT-OPERATED STEAM TRAPS

Alejandro Wichtel, Wyncote, Pa., assignor to Yarway Corporation, Blue Bell, Pa.

Continuation of Ser. No. 200,810, Nov. 22, 1971, abandoned.
This application Apr. 27, 1973, Ser. No. 355,274
Int. Cl. F16t *1/08*
U.S. Cl. 236—54 **6 Claims**



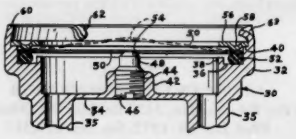
A pilot-operated steam trap is provided with a series of bimetallic elements which operate sequentially to control the opening and closing of the pilot valve of a pilot-operated steam trap. Each separate series of the bimetallic elements have their outer edges on separate shoulders within the valve member and have central openings through which the stem of the pilot valve passes. Separate shoulders are provided on the stem of the pilot valve, each adapted to be engaged by one of the series of bimetallic elements to prevent transmission of the force of one bimetallic element to the next adjacent bimetallic element.

3,790,077

TEMPERATURE-SENSITIVE BLEED VALVE

Thomas William Wisyanski, Bristol, and Richard Alfred Northrop, Jr., Cheshire, both of Conn., assignors to Scovill Manufacturing Company, Waterbury, Conn.

Filed Mar. 12, 1973, Ser. No. 340,596
Int. Cl. G05d *23/08*
U.S. Cl. 236—101 **5 Claims**



Temperature-sensitive bleed valve has bimetallic disc mounted between O-ring and retainer ring to accommodate variations in casting of valve housing and to hold firmly despite vibrations. The valve operates effectively irrespective of its mounting position.

3,790,078

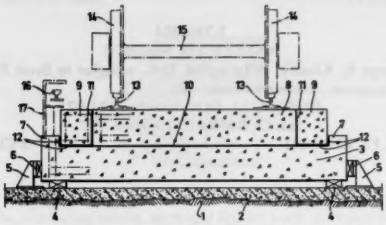
VIBRATOR DAMPING OF VEHICLE PATH

Bo Malte S. Egerbork, Ekero; Goran R. Gadefelt; Gunnar Ingemar Hagbjer, both of Stockholm, and Kjett Knut I. Spang, Vallingby, all of Sweden, assignors to Akustikbyran Ab, Stockholm, Sweden

Filed May 25, 1971, Ser. No. 146,777
Claims priority, application Sweden, May 28, 1970, 7356/70
Int. Cl. E01b *1/00*
U.S. Cl. 238—2 **5 Claims**

Track supporting apparatus for vehicles to dampen vibrations arising as a result of vehicle movement on the track. The

apparatus comprises a bottom plate which extends in the longitudinal direction of the track and which is supported by an elastic support means. At least one upper plate is disposed on the bottom plate, with a damping layer interposed between the



bottom plate and the upper plate. A further means is provided for inhibiting relative lateral movement between the bottom plate and the upper plate. The damping layer may comprise a layer of viscoelastic material which is very thin relative to the thickness of the plates.

3,790,079

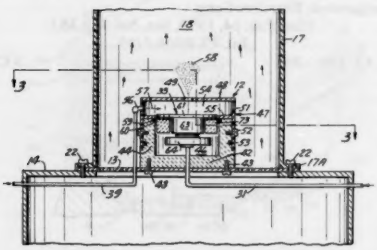
METHOD AND APPARATUS FOR GENERATING MONODISPERSE AEROSOL

Richard N. Berglund, St. Paul, and Benjamin Y. H. Liu, Minneapolis, both of Minn., assignors to RNB Associates, Inc., Minneapolis, Minn.

Filed June 5, 1972, Ser. No. 259,374

Int. Cl. B05b *5/00, 7/00, 17/06*

U.S. Cl. 239—3 **38 Claims**



A vibrating orifice monodisperse aerosol generator usable as a basic aerosol standard having a liquid feed system, a droplet generator, a droplet dispersion system and an aerosol flow system. The liquid feed system is a syringe pump operable to feed liquid into the droplet generator. The liquid is discharged from the droplet generator through a small orifice as a liquid jet. The jet disturbed at a constant frequency with an oscillating piezoelectric ceramic breaks up into uniform droplets. The droplets are dispersed by a turbulent air jet and diluted into a monodispersed aerosol.

3,790,080

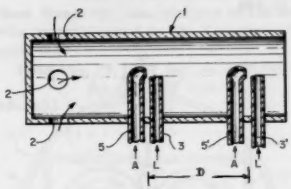
METHOD OF SPRAYING

Robert S. Babington, 1113 Ingleside Ave., McLean, Va.

Filed May 22, 1972, Ser. No. 255,686

Int. Cl. B05b *7/00*

U.S. Cl. 239—8 **5 Claims**



Improved performance of known techniques of spraying liquids to form extremely dense liquid sprays or aerosols can be obtained by pre-saturation of the carrier gas at a given location before final introduction of the product to be aerosolized into the spraying system.

3,790,081

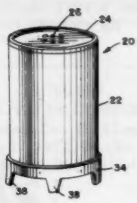
VAPOR DISPENSING DEVICE

James C. Thornton, and Donald E. Whyte, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed June 26, 1972, Ser. No. 266,163

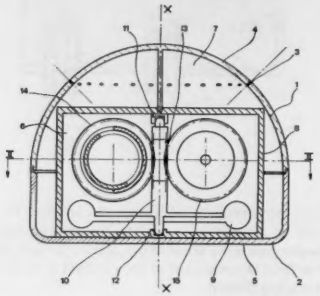
Int. Cl. A61l *9/04*

U.S. Cl. 239—55 **27 Claims**



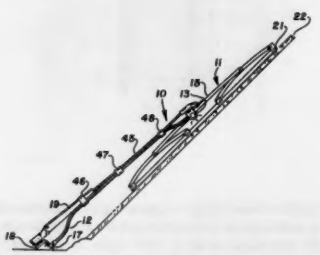
A device for dispensing a vaporizing composition to the surrounding atmosphere characterized by a hollow tubular body with end members sealing the open ends and apertures through the end members, a porous core member impregnated with a vaporizing composition, having a multiplicity of passages defined through the core member communicating between the end members and having end surfaces displaced from the end members, and a mounting means to maintain the device in a position such that there is free access of the atmosphere through the apertures of both ends. The device provides a continuous dispensing of a vaporizing composition and can provide a greatly increased dosage to the atmosphere as required from time to time. One specific feature of a preferred embodiment of our invention is a pumping means to further aid in rapid dispensing of vapors. A primary application is the deodorizing of a room.

3,790,082
SPRINKLER
Michel Adrien Pochard, Thonon Les Bains, France, assignor to Etablissements Carpano & Pons S.A., Cluses, France
Filed Mar. 15, 1972, Ser. No. 234,715
Claims priority, application France, Mar. 30, 1971, 71.11182
Int. Cl. B05b 3/04
U.S. Cl. 239—240 11 Claims



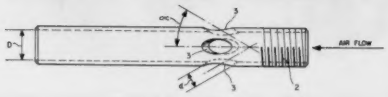
A liquid sprinkler comprises a hydraulic turbine driven by a supply of pressurized liquid, the turbine in turn driving two pairs of relatively rotatable coaxial cylinders. Each pair of cylinders comprises a pair of cooperating slots adapted, during relative rotation of the cylinders, to provide a variable passageway for delivering liquid to a respective outlet compartment provided with a set of outlet orifices, the sum of the passageway areas remaining constant to provide a constant overall liquid output, with varying outputs through the orifices of each compartment.

3,790,083
WINDSHIELD WASHER SYSTEM
Robert B. Redifer, 6339 Nicollet Ave., Minneapolis, Minn.
Filed Nov. 9, 1971, Ser. No. 197,023
Int. Cl. B05b 1/14
U.S. Cl. 239—284 3 Claims



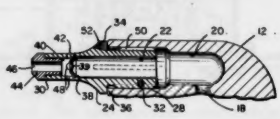
An improved nozzle means for spraying washer fluid on the surface of an automobile windshield, the nozzle means being arranged for use in combination with an automobile windshield wiper and washer system, the wiper being the standard reciprocating wiper, the washer system including a reservoir to retain a supply of washer fluid, and pressure means to provide a source of such fluid under pressure. Conduit means are arranged to deliver fluid under pressure to said nozzle means. The nozzle means comprises a head having an inlet port and a plurality of outlet ports, with the plurality of outlet ports being generally equally arcuately spaced, one from another, and being disposed so as to impinge upon the surface of said wiper at spaced intervals thereon. Bracket means are provided for mounting the nozzle means on the back of the wiper blade assembly.

3,790,084
SAFETY AIR NOZZLE
George R. Kinsley, Wilmington, Del., assignor to Scott Paper Company, Delaware County, Pa.
Filed July 14, 1972, Ser. No. 271,921
Int. Cl. B05b 1/28; A62c 13/52
U.S. Cl. 239—291 3 Claims



Disclosed is a safety air nozzle which can be used to inexpensively adapt a standard air blow gun to comply with the provisions of the Occupational Safety and Health Act, Section 1910.242(b). The nozzle consists of a single piece of pipe threaded on one end for attachment to a standard air blow gun and having lateral ports through the tube wall equally spaced circumferentially about the pipe. Each lateral port extends in a direction inclined outwardly toward the discharge end of the nozzle. The lateral ports allow escape of air to form an air shield which guards the air gun operator from chips blown back toward him and also to form pressure relief holes which prevent excessive pressure buildup in the event the discharge end of the nozzle become obstructed.

3,790,085
SAFETY NOZZLE FOR AIR BLOW-GUNS
Lloyd M. Ayer, Hamden, Conn., assignor to High Precision Incorporated, Hamden, Conn.
Filed Feb. 14, 1973, Ser. No. 332,353
Int. Cl. B05b 1/28
U.S. Cl. 239—291 3 Claims



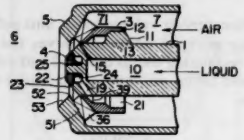
An improved safety nozzle for air blow-guns which prevents pressure build-up in the nozzle in case the tip of the nozzle is obstructed in any manner and which also provides protection against possible injuries that could be inflicted by the air vented from the nozzle when such obstruction takes place. The invention is applicable to those guns which prevent pressure build-up by recessing the nozzle tip within an extension of the nozzle so that the tip is inaccessible and by providing radial vent openings in such extension, through which the air can escape when the outer end of the extension is blocked. Auxiliary air jets aligned with the vent openings deflect the air from the vents away from the operator.

3,790,086

ATOMIZING NOZZLE

Tadahisa Masai, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 24, 1972, Ser. No. 256,372
Claims priority, application Japan, May 24, 1971, 46/35757
Int. Cl. B05b 7/10
U.S. Cl. 239—406 15 Claims



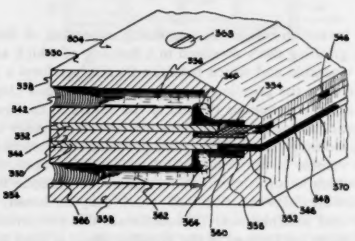
The atomizing nozzle atomizes liquids such as heavy oil to be burned with the energy of a moving gas stream to make fine liquid particles and avoid the phenomena of recombination of the liquid. Gas is generally conically swirled along the front face of a nozzle end while liquid is ejected into the gas flow, in combination with means for preventing the recombination of the liquid to a liquid stream along the nozzle surface adjacent the liquid ejection ports. The recombination is particularly prevented by gas ejection downstream from the liquid ejection and the downstream projection of the recombination surface into the whirling gas flow. Further, the gas boundary layer along the liquid ejection surface is sucked off, particularly for downstream ejection, to increase the gas flow velocity adjacent the liquid ejector.

3,790,087

BURNER APPARATUS FOR FORMING A FINISH ON A GLASS CONTAINER

John D. Banyas, Toledo, and Edward A. Ross, Waterville, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 77,425, Oct. 2, 1970, Pat. No. 3,726,559.
This application Aug. 29, 1972, Ser. No. 284,565
Int. Cl. F23d 11/10, 13/40, 15/00
U.S. Cl. 239—418 2 Claims



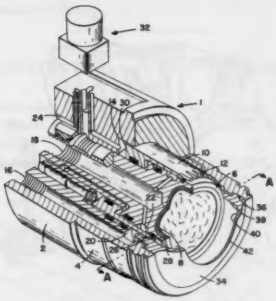
A burner apparatus for forming a finish on a hollow glass article on a production line, such as a glass container. Glass containers having an integrally formed moil portion on the upper end of the container body portion are loaded in sequence on a continuously moving endless conveyor which carries the containers in line through a heating zone. During their transit through the heating zone, the containers pass between a linear row of opposed burners which direct a high intensity row of flame jets accurately against a narrow portion of the container body to first thermally sever the moil portion from the body and to subsequently form a beaded finish on the container. The containers are rotated during their passage through this set of burners at a controlled rate to achieve the desired finish formation. The burner assembly includes top and bottom housings and an intermediate shim plate that define together plural slots connected to a fuel chamber that is in a recess longitudinally of the burner housing. Air and fuel are supplied to the recess chamber for combustion upon exit from said slots.

3,790,088

PROPELLANT SPLASH PLATE HAVING FLOW DIRECTING MEANS

Ben F. Wilson, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 29, 1967, Ser. No. 665,199
Int. Cl. B05b 7/06
U.S. Cl. 239—432 5 Claims



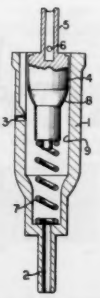
An improved propellant splash plate for use with splash plate type injectors, e.g., an annular serrated pintle, variable thrust type injector for controlling the flow of liquid propellants in the combustion chamber of reaction motors. The improvement resides in the provision of flow directing means in the form of either grooves or ribs which are preferably spirally formed for increasing the retention or "stay" time of the liquid propellants on the plate. High combustion efficiency is attained due to the increased "stay" time and improved overall mixing of the propellants in the combustion chamber. This improved mixing includes breakup, atomization, and vaporization of the liquid sheets on the plate.

3,790,089

AEROSOL VALVE CONSTRUCTION

John Frangos, 244 Hudson Ter., Fort Lee, N.J.

Filed Jan. 27, 1972, Ser. No. 221,144
Int. Cl. B65d 83/14
U.S. Cl. 239—573 2 Claims



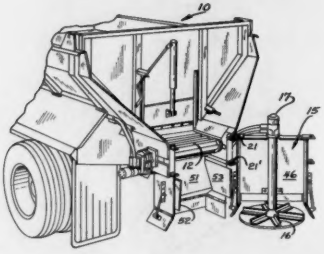
A push-button aerosol valve for varying droplet size of the liquid to be dispensed comprising a cylindrical valve body pro-

vided with a bore therethrough, a spring biased valve core located in said bore, the valve core having a tapered portion which in conjunction with a wall portion of the bore acts to vary the cross-sectional area between the wall portion and the tapered portion when the core is depressed to create a venturi effect.

3,790,090
TRUCK BODY

Allan L. Lorenc, Fairfax, and John E. Blumer, Cedar Rapids, both of Iowa, assignors to Highway Equipment Company, Cedar Rapids, Iowa

Filed Mar. 12, 1973, Ser. No. 340,564
Int. Cl. A01c *19/00*; E01c *19/20*
U.S. Cl. 239—666 **5 Claims**

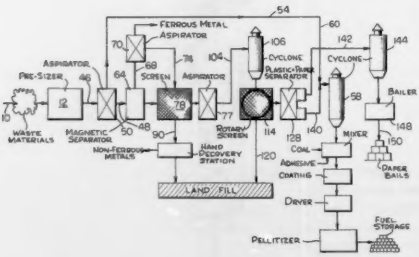


A truck body of the hopper type including a bottom longitudinally extending conveyor and a rear end gate arranged for pivotal opening for dumping without tilting of the truck body and with a metering feed gate in the end gate for use in spreading. The body is further equipped with a spreader of the spinner type which receives material from the conveyor, the spreader being selectively pivotable to one side to facilitate dumping. The conveyor is equipped with a hydraulic power system providing the use of two motors in parallel for high torque and the same two motors in series for high speed.

3,790,091
SOLID WASTE SEPARATING METHOD AND CLASSIFICATION OF MATERIAL

Edward Law, Fort Wayne, Ind., and James H. Moore, Dallas, Tex., assignors to National Recycling Inc., Fort Wayne, Ind.

Filed June 7, 1971, Ser. No. 150,671
Int. Cl. B02c *18/40*
U.S. Cl. 241—24 **16 Claims**



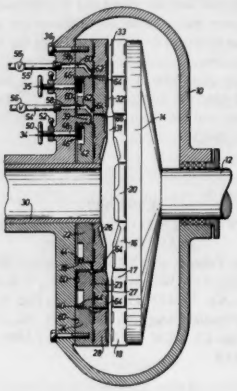
A method for separating solid waste material into identifiable classifications by recycling the solid waste material obtained from industrial or domestic source through a number of devices which reduces the solid waste material to a uniform workable particle size; separating the presized particles by weight, size and magnetic properties; transferring the classified material to a number of disposal areas wherein the materials such as heavy paper material may be baled, the light paper and plastic may be pelletized for use as fuel, the metal and glass shipped to reprocessing plants, and the remainder of the solid waste material may be disposed of by land fill or incineration.

The invention further relates to an anti-pollution method for solid waste material which conserves the virgin natural resources by reclaiming useful material and minimizing areas needed for land filling, and reduces the solid waste management problem.

3,790,092
GRINDING APPARATUS

Rolf Bertil Reinhall, Killingevagen 16, Lidingo, Sweden

Filed Feb. 29, 1972, Ser. No. 230,393
Claims priority, application Sweden, Mar. 16, 1971, 3397/71
Int. Cl. B02c *7/06*
U.S. Cl. 241—38 **3 Claims**



The invention relates to a grinding apparatus of the type having grinding discs arranged in a housing of which at least one is rotatable and which between themselves form a grinding space for the grinding produce such as wooden chips fed dispersed in an aqueous vehicle to the centre of the space to be forced therethrough in outward direction under strong axial grinding pressure. Under this procedure the temperature of the vehicle is increased which results in evaporation of water which in turn unfavourably affects the produce such as the wooden chips the fibres of which may be locally overheated and miscoloured. To counteract this evaporation of water, ducts are formed in the grinding discs, at least the stationary one for supply of water to the grinding space between the discs. This arrangement is particularly useful when the grinding discs are composed of concentrical elements defining an outwardly decreasing grinding space permitting a highly advanced desintegration of the starting material.

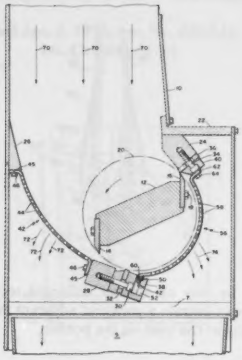
3,790,093
GRANULATOR

John W. McIntyre, Attleboro, Mass., assignor to Cumberland Engineering Company, Inc., Pawtucket, R.I.

Filed Nov. 18, 1971, Ser. No. 200,130
Int. Cl. B02c *18/06, 13/13*
U.S. Cl. 241—73 **8 Claims**

A granulator for synthetic plastic and other material such as cans made of thin steel or aluminum in which, instead of one

screen to permit the exit from the machine of material cut to size, a second screen is also provided, the second screen being



mounted adjacent the inlet side of the cutting element of the granulator and at the bottom of a vertical chute for feeding materials to the granulator.

3,790,094

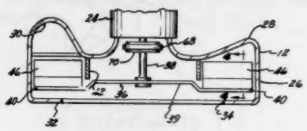
MOBILE LEAF PULVERIZER

John J. Spicer, 43872 Shearer Dr., Plymouth, Mich.

Filed Mar. 22, 1972, Ser. No. 236,820

Int. Cl. B02c *18/12*

U.S. Cl. 241—101.1 **11 Claims**



A mobile leaf pulverizing apparatus having a pick-up blade in an open-bottomed housing. The pick-up blade is rotated parallel to and above the ground to provide an upward air current that removes leaves and the like from the ground. The leaves pass through the pick-up housing to a cylindrical pulverizer having a rotary cutter. Although the pulverizer housing has a plurality of openings for passing the air received from the pick-up housing, certain of the openings are formed to prevent the passage of leaf particles except through the remainder of the openings. The pulverizer can be disconnected from the pick-up housing when the leaves are to be only transferred from one ground area to another.

3,790,095

PULVERIZER WITH SATELLITE SPACER ASSEMBLY

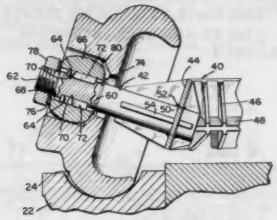
Robert Paul Gillette, R.D. 3, Radtke Rd., Shongum Lake, Randolph, N.J.

Filed Apr. 28, 1972, Ser. No. 248,707

Int. Cl. B02c *15/04*

U.S. Cl. 241—103 **4 Claims**

Apparatus is provided for pulverizing raw coal feed stock into comminuted particles which can be conveyed to the combustion chamber of a furnace. A satellite spacer assembly is positioned above the pulverizer table and mounted on the pulverizer rollers such that the rollers are separated from each other to prevent skidding.



3,790,096

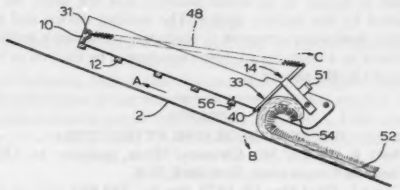
DEVICE FOR STARTING A TURN IN THE END OF A SOD STRIP

Gerardus Johannes Brouwer, Keswick, Ontario, Canada, assignor to Brouwer Turf Equipment Limited, Keswick, Ontario, Canada

Filed Feb. 8, 1973, Ser. No. 330,489

Int. Cl. B65h *75/02, 17/02*

U.S. Cl. 242—55 **10 Claims**



A device for starting a turn in the end of a sod strip advancing up a conveyor, in which a tray is loosely mounted above the conveyor for front to back rocking movement and for movement towards and away from the conveyor. An L-shaped blocking member is pivotally mounted at the front of the tray and has a blocking portion normally hanging in the path of the advancing sod. When the sod hits the blocking portion, the blocking member pivots upwardly to a limited extent against a spring bias, turning the end of the sod strip and permitting the turned end to pass thereunder while holding the turned end tight. The turned end then passes under the remainder of the tray, rolling as it progresses. The tray rises at this time to allow the turned end passage. Rolling of the sod is then completed by conventional rolling means. The device will also start a turn in the end of a sod strip lying on the ground.

3,790,097

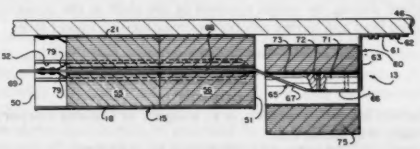
TOILET TISSUE ROLL STORAGE DEVICE

Thaddaues H. Wormly, 1218 Liberty St., Camden, N.J.

Filed Jan. 5, 1973, Ser. No. 321,358

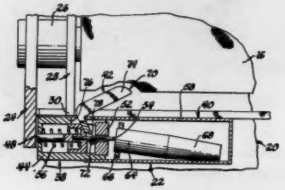
Int. Cl. B65h *19/00*

U.S. Cl. 242—55.53 **10 Claims**



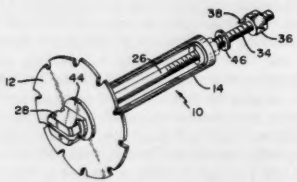
An elongate open ended enclosure for snug passage therethrough of a transversely flattened or oblate toilet paper roll, and a carrier for endwise engagement into a roll exiting from the enclosure to rotatably support the roll.

3,790,098
SEAT BELT RETRACTOR APPARATUS
Gerald F. Lewis, 1850 Columbia, Berkley, Mich.
Filed Mar. 8, 1972, Ser. No. 232,823
Int. Cl. A62b *35/00*; **B65h** *63/04*
U.S. Cl. 242—107.4 **14 Claims**



Seat belt retractor apparatus incorporating a latch bar for locking the belt in a selected retracted position. The latch bar is maintained in an unlatched position by a holding mechanism which is responsive to inertia forces. The holding mechanism has a locking device which combines with a magnet device in a set position thereof to hold the latch in the unlatched position until inertia forces acting on the magnet device exceed a certain magnitude whereupon the magnet device is forced to an unset position and the latch bar is released by the locking device. The locking device and the magnet device are returned to their respective latch holding positions by a reset device which is actuated by the belt as it is rewound by the retractor.

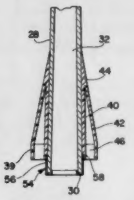
3,790,099
ENERGY ABSORBING RETRACTOR
Herbert R. Beller, Mt. Clemens, Mich., assignor to Allied Chemical Corporation, New York, N.Y.
Filed May 10, 1972, Ser. No. 252,057
Int. Cl. A62b *35/00*; **B65h** *63/00*
U.S. Cl. 242—107.4 **10 Claims**



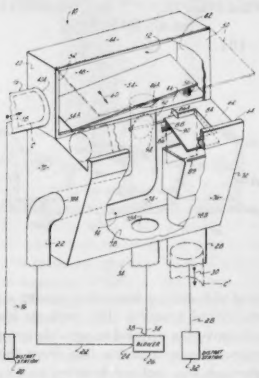
An energy absorbing seat belt retractor of the automatic locking or inertia locking type which includes an energy absorbing system that allows a belt shaft to rotate with respect to a locking wheel at a predetermined applied load so that belting is paid out. After a predetermined amount of rotation of the belt shaft, an increased load is required to further pay out the belting. Kinetic energy of an occupant moving forward from his seated position into contact with the belting is absorbed during the initial rotation of the shaft at the predetermined load and during any further rotation at a higher level.

3,790,100
BOBBIN
Herbert Kilduff, Warwick, R.I., assignor to Leesona Corporation, Warwicke, R.I.
Filed May 21, 1971, Ser. No. 145,726
Int. Cl. B65h *75/10, 75/28*
U.S. Cl. 242—118.32 **5 Claims**

A yarn collecting bobbin comprising an elongated, tapered tube having a frustro-conical skirt affixed thereto is disclosed. The skirt encircles generally the base section of the bobbin, with a relatively short extension from the tube projecting beyond the lower end of the skirt. The skirt is firmly secured to the tube by any of several different techniques and is notched so as to entrain a yarn end adjacent thereto and commence winding of the yarn on the bobbin.



3,790,101
COMBINED TRANSMIT AND RECEIVE TERMINAL FOR PNEUMATIC TUBE SYSTEM
Adam Weissmuller, Kinnelon, N.J., assignor to The Mosler Safe Company, Hamilton, Ohio
Filed Nov. 8, 1972, Ser. No. 304,754
Int. Cl. B65g *51/32*
U.S. Cl. 243—19 **6 Claims**

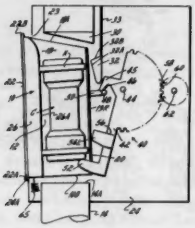


A pneumatic tube system terminal including *a*) a receive chamber in which a received carrier, in the course of sliding or rolling over an underlying spring-biased flap, deflects the flap to seal the vacuum line which connects to the receive chamber, enabling opening of the receive chamber door normally closed by the vacuum, the flap once being deflected remaining so under the action of the vacuum in the line which is now sealed by the flap in its deflected position, and *b*) a transmit chamber connected to a pressure line, having an actuator linked to a valve in the vacuum line, which actuator (1) upon insertion of a carrier into the chamber for transmission is tripped to momentarily close the valve in the vacuum line, in turn releasing the spring-biased receive chamber flap, and (2) upon passage of the inserted carrier into the transmit tube opens the valve in the vacuum line to restore vacuum/pressure in the system and transmit the carrier.

3,790,102
PNEUMATIC TUBE TRANSMIT AND RECEIVE TERMINAL

David Tearne, Ridgewood, and Adam Weissmuller, Kinnelon, both of N.J., assignors to The Mosler Safe Company, Hamilton, Ohio

Filed Jan. 2, 1973, Ser. No. 320,546
Int. Cl. B65g *51/32*
U.S. Cl. 243—19 11 Claims

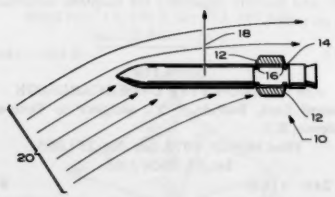


A combined transmit and receive terminal for pneumatically transported carriers including a housing communicating with an upwardly directed pneumatic tube and having an opening therein, a latch within the housing located above the mouth of the tube to suspend a received carrier from its upper end, a hopper with an open top and bottom hinged along its lower edge to the housing and movable between a closed or vertical position overlying the pneumatic tube with the open hopper bottom aligned with the mouth of the tube and an open or pivoted position extending through the terminal opening, and a multi-function rotary actuator which, upon rotation to its open position following receipt of a carrier, (1) disengages an inwardly projecting extension of the hopper to unlock it, (2) cams open the hopper, and (3) engages the bottom of a suspended carrier to lift it upwardly and at least partially out of the hopper as the latter is cammed toward its open position. Carrier insertion into the terminal for transmission is accomplished by reversing the foregoing unlocking, lifting and door camming steps.

3,790,103
ROTATING FIN

John R. Peoples, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 118,266, Feb. 24, 1971, abandoned. This application Aug. 21, 1972, Ser. No. 282,525
Int. Cl. F42b *15/14*
U.S. Cl. 244—3.23 2 Claims

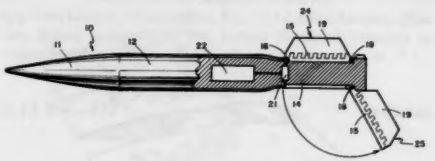


A rotatable sleeve with attached clipped double delta shaped fins for mounting on a missile body so that the fins may achieve a position of symmetry with respect to incident air flow thereon without spinning-up.

3,790,104
HIGH/LOW ASPECT RATIO DUAL-MODE FIN DESIGN

Daniel A. Jones, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 12, 1973, Ser. No. 340,123
Int. Cl. F42b *13/32*
U.S. Cl. 244—3.27 5 Claims

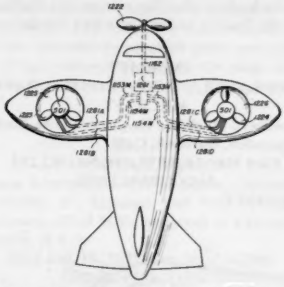


A dual-mode fin design for gun-launched, rocket-assisted, guided projectiles in which, from a flush position against the body, the fins rotate radially at launch to deploy in the low aspect-ratio mode for stability during the supersonic fly-out phase with transition to the high aspect-ratio mode for the transonic termianl maneuvering phase. Deployment of the fins to high aspect-ratio mode is effected by shearing restraining pins which allow the fins to rotate rearwardly about pivot pins and under the air stream influence.

3,790,105
HYDRAULICALLY CONTROLLED FLUID STREAM DRIVEN VEHICLE

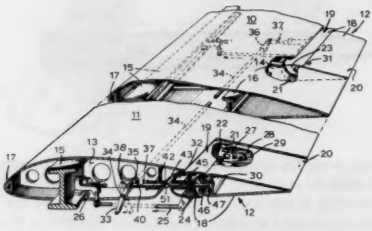
Karl Eickman, 2420 Isshiki Hayama-machi, Kanagawa, Japan

Continuation of Ser. No. 782,349, Dec. 9, 1968, which is a continuation-in-part of Ser. Nos. 328,395, Dec. 5, 1963, and Ser. No. 551,023, May 18, 1966, abandoned. This application Apr. 6, 1971, Ser. No. 131,782
Int. Cl. B64c *29/00*
U.S. Cl. 244—12 R 12 Claims



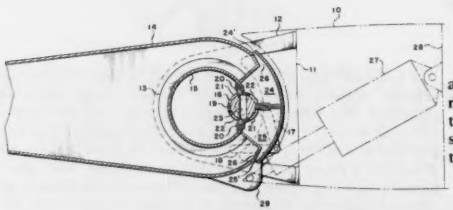
A hydraulic fluid driving arrangement for land, water or air vehicles includes rotary hydraulic motors driving respective propellers. The motors are arranged in pairs, with the two motors of each pair being on respective opposite sides of the longitudinal axis of the vehicle. One or more hydraulic pumps are driven by a prime mover and deliver hydraulic fluid under pressure to two or more separate outlets, with the flows in all outlets being either proportionate or equal to each other, and the outlets being completely separate from each other. One outlet supplies fluid to the motors on one side of the vehicle axis and the other supplies fluid to the motors on the other side of the vehicle axis. Respective flow adjustment means are operably associated with each outlet, and may be operated either independently or conjointly. Alternatively, control of the motor speeds may be provided by bypasses. Two or more outputs of the hydraulic pumps may be combined to supply two or more motor supply lines with equal or proportionate flows, with check valves being provided to prevent reverse flow. The two motors of each pair may be connected in series to receive the same fluid flow.

3,790,106
FLAP SYSTEM
Thomas E. Sweeney, 95 Hartley Ave., Princeton, N.J.; William S. Schweizer, 58 Larchmont Rd., Elmira, N.Y., and James J. Morris, 108 Meadow Brook Ln., Brookhaven, Pa.
Filed Jan. 24, 1973, Ser. No. 326,393
Int. Cl. B64c 3/38
U.S. Cl. 244—42 CB 10 Claims



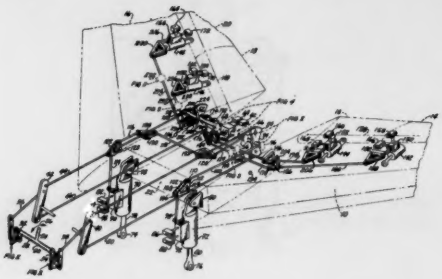
A flap system for improving the lifting capabilities of aircraft wings and for alleviating the effects of wind gusts acting upon aircraft including flaps pivotally mounted near the trailing edges of the aircraft's wings, which each have a separate and distinctive leading edge portion and a trailing portion which are pivotally connected. Locking apparatus are provided which can be actuated to lock the leading edge portion and the trailing edge portion of each flap together, and to maintain the leading edge portion of each flap in a stationary position relative to the wing when the trailing flap portion is disengaged from the leading edge flap portion. When the leading edge flap portion and the trailing edge flap portion are locked together, the flap serves as a high lift flap and when the leading edge flap portion is held in a stationary position with respect to the wing and the trailing edge flap portion is disengaged from the leading edge flap portion, the trailing edge flap portion is freely floating and acts as a gust alleviation flap.

3,790,107
BOUNDARY LAYER AIR CONTROL MECHANISM FOR AIRCRAFT
John H. Renshaw, Marietta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Mar. 16, 1973, Ser. No. 342,253
Int. Cl. B64c 21/08
U.S. Cl. 244—42 CC 5 Claims



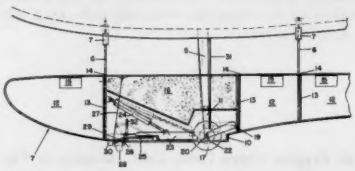
Pressurized air is provided from an onboard aircraft source to a duct within an external control surface where it is selectively metered through a control valve to nozzles located on each side of the control surface. Movement of the control surface in one direction concurrently moves the control valve to pass the air exclusively to the nozzles on one side of the surface while movement of the control surface in the opposite direction concurrently moves the control valve to pass the air exclusively to the nozzles on the other side of the surface. Thus boundary layer air control is provided to the desired side of the control surface automatically from a single duct.

3,790,108
REDUNDANT STABILIZER CONTROL
John W. Bock, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Nov. 13, 1972, Ser. No. 306,377
Int. Cl. B64c 13/04
U.S. Cl. 244—83 D 9 Claims



A redundant control system for operating two flight control surfaces such as a rotatable stabilizer and an elevator rotatably mounted thereon whereby in the event of either control surface mechanically jamming, the preselected control system may still be used to actuate the unjammed control surface.

3,790,109
AMPHIBIOUS UNDERCARRIAGE FOR AIRCRAFT
C. Fink Fischer, 369 Mercer Rd., Princeton, N.J.
Filed Mar. 15, 1971, Ser. No. 124,029
Int. Cl. B64c 25/54
U.S. Cl. 244—105 6 Claims

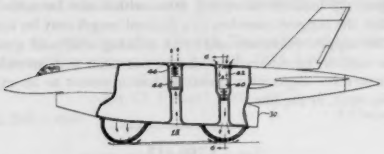


The invention is an amphibious undercarriage for aircraft and is also an undercarriage for seaplanes providing improvements which reduce the maximum landing and takeoff structural loads in the aircraft, reduce the weight and drag of the seaplane, and provide capability for seaplane undercarriages to alight on snow.

3,790,110
AIR CUSHION TYPE UNDERCARRIAGE
T. Desmond Earl, Buffalo, N.Y., assignor to Textron Inc., Providence, R.I.
Filed May 25, 1972, Ser. No. 257,005
Int. Cl. B60v 3/08
U.S. Cl. 244—110 H 9 Claims

An improved ground-run deceleration and landing acquisition and temporary hold-down system for aircraft equipped with an air cushion type undercarriage. The invention employs means for the rapid withdrawal of air from the cushion cavity, whereby the time to decelerate the airplane is greatly decreased, and whereby an improved landing acquisition and

temporary on-board hold-down facility is provided. The invention, therefore, has particular application to the problem

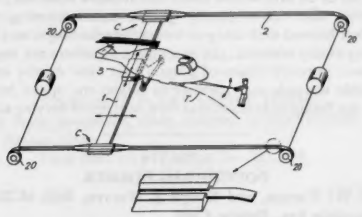


in association with VTOL aircraft of "acquiring" and holding to a firm landing on pitching/rolling landing pads, and/or incidental to landings under adverse surface wind conditions.

3,790,111
APPARATUS FOR DOCKING A HELICOPTER

Jean Dominique Francois Gerard Mesnet, Vaucresson; Philippe Marie Antoine Jacques Remon-Beauvais, Ris Orangis; Jean Francois Barbarin, Ruelle; Raymond Louis Le Guennec, Lorient, and Georges Edouard Louis Leon Dadon, Kremlin-Bicetre, all of France, assignors to Etat Francais, Paris, France

Filed Oct. 2, 1972, Ser. No. 294,002
Claims priority, application France, Oct. 1, 1971, 71.35383
Int. Cl. B64f *1/12*
U.S. Cl. 244—116 **11 Claims**

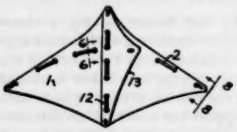


A device for displacing an object on a horizontal surface, which can tilt and oscillate, along a desired trajectory between any two points. The trajectory is derived from a lengthwise motion of a cross beam, generated by a driving mechanism entirely independent of the cross beam and by a transverse motion of a cross slide on the cross beam, the transverse motion being obtained from the load component acting upon the cross beam due to a manual or mechanical orientation of the load itself. The orientation is obtained, as required, by a means external to the device.

3,790,112
KITES

Raymond Prunty Holland, Jr., 1702 W. Third St., Roswell, N. Mex.

Filed Nov. 11, 1971, Ser. No. 197,838
Int. Cl. B64c *31/06*
U.S. Cl. 244—153 R **2 Claims**

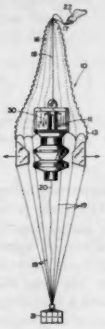


A kite uses wooden sticks having a figure-8 cross section made of two round sectioned sticks glued together side by side, producing freedom from stick breakage and uniformity of stick bending deflection, using materials available commercially in large quantities. The construction applies most advantageously to kites having strongly bent sticks and to kites of high aspect ratio and especially to kites as taught in U.S. Pat. No. 3,335,984.

3,790,113
PARACHUTE ARRANGEMENT

Osyp Nimylowycz, Philadelphia, Pa., and George Lorenz, Clinton, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1972, Ser. No. 316,954
Int. Cl. B64d *17/54*
U.S. Cl. 244—149 **5 Claims**

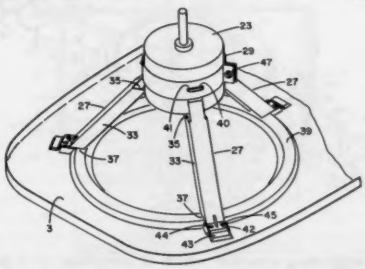


A parachute arrangement having a mechanical parachute spreader positioned internally of the canopy skirt and connected at one end by a lanyard to the canopy apex. An initiator firing pin mounted in the lower end of the spreader is connected by a firing lanyard to a load when deployed. A plurality of wedge-shaped slugs, each attached to parachute suspension lines, are initially latched within the mechanical spreader. An annular piston, actuated by pressure gases generated from a propellant charge, releases and ejects the slugs radially outward to assist the suspension lines in opening the parachute canopy skirt.

3,790,114
FAN MOTOR MOUNT

Frank Italiano, Liverpool; Curtis L. Tobin, Chittenango; William C. Martin, Jr., Syracuse, and Fred V. Honnold, Jr., North Syracuse, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 10, 1972, Ser. No. 216,398
Int. Cl. F16m *11/04*
U.S. Cl. 248—13 **3 Claims**



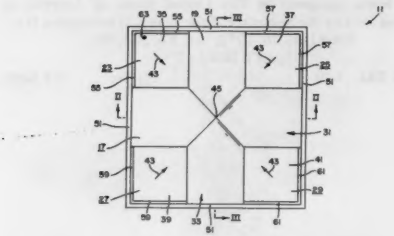
A motor mounting assembly for securing and accurately positioning a motor relative to a base member, the elements of the mounting assembly being secured to the motor, the base member and to each other by a single fastener.

3,790,115

BASE FOR AIR CONDITIONING CONDENSER APPARATUS

Charles S. Fox, Germantown, Tenn., and Ralph E. Easterday, P.O. Box 17622, Memphis, Tenn., assignors to said Easterday by said Fox

Filed Jan. 11, 1972, Ser. No. 217,020
Int. Cl. F16m *5/00*
U.S. Cl. 248—19 **10 Claims**



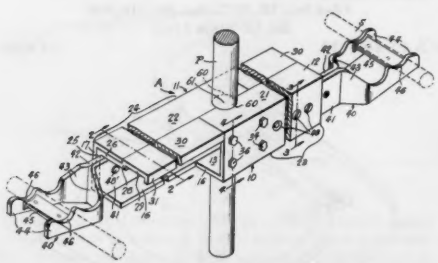
A base for restingly supporting an operative air conditioning condenser apparatus. The base is intended to be restingly placed on a level planar support surface and includes a main body member having a canted upper surface which slopes downwardly and outwardly in several directions from a centrally located high point. The base also includes a plurality of elevated support pads which support the condenser apparatus in a manner that allows for air circulation subjacent the condenser apparatus. The upper surface of the support pads are canted to slope inwardly and downwardly and include self-lubricating structure to cause the condenser apparatus to slidably gravitate to a substantially level position. An anchoring and/or grounding rod is included which is received in a vertical extending aperture in the base and may be driven into certain of the support surfaces, e. g., the earth.

3,790,116

EXPANDABLE SUPPORT

Abraham J. Schulman, 4488 Circle Rd., Montreal 248, Quebec, Canada

Filed Nov. 1, 1971, Ser. No. 194,661
Claims priority, application Great Britain, Jan. 5, 1971, 375/71
Int. Cl. F16m *13/02*
U.S. Cl. 248—124 **11 Claims**



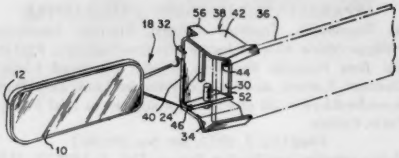
A supporting structure which is comprised of a pair of cooperating support members engageable with each other in abutting and staggered relationship and secured to form a unitary structure. The upwardly presented surfaces of each of the cooperating support members are presented in coplanar relationship to form a relatively flat surface for supporting shelves or other panel forming members. Extension members may be connected to each of the support members in order to complete the upwardly presented flat planar surface. A pair of oppositely located mounting arms which can be telescoped within the support member to a desired length may be secured to the support members and to an existing structural member. The support members may also be provided with an enlarged aperture for disposition about and securement to an existing pole, strut, or the like.

3,790,117

AUXILIARY REAR VIEW MIRROR

Charles Winkler, 21 Devon St., Malverne, N.Y.

Filed May 8, 1972, Ser. No. 251,175
Int. Cl. B60r *1/04*
U.S. Cl. 248—481 **5 Claims**



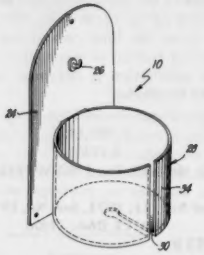
An auxiliary rear view mirror in which a mirror is pivoted on one end of an arm whose other end forms a stationary clamp member that telescopically guides a cooperating clamp member formed with integral means for retaining it on the stationary clamp member; the two clamp members are engageable over opposed edges of a main rear view mirror and are movable towards one another to adjust the space between them for fitting over main rear view mirrors of varying sizes.

3,790,118

DOUCHE BAG HOLDER

Chris W. Warren, and Evelyn J. Warren, both of 2535 S. Mountain Ave., Duarte, Calif.

Filed Mar. 1, 1972, Ser. No. 230,846
Int. Cl. A47k *3/22*
U.S. Cl. 248—311 **2 Claims**



A douche bag holder having a mounting base for attachment to a supporting surface, a hanger on the base for releasable attachment to the neck of the bag, and a cup-shaped support on the base below the hanger for receiving and supporting the bottom of the bag both vertically and laterally. The bag support has a slot which extends from the center of the bottom support wall radially outward through the edge of the wall and then upwardly through the support side wall to and through the upper edge of the latter wall for receiving the douche bag tube in a position wherein the tube hangs freely below the bottom wall.

3,790,119

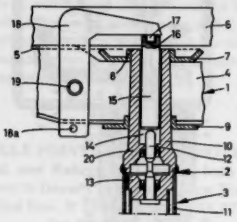
ENERGY STORING DEVICE, PARTICULARLY A BLOCKABLE PNEUMATIC SPRING

Fritz F. Bauer, Schulzstrasse 14, 8503 Altdorf B. Nbg., Germany

Filed Aug. 31, 1971, Ser. No. 176,533. The portion of the term of this patent subsequent to Apr. 18, 1989, has been disclaimed.

Int. Cl. F16m *1/00*

U.S. Cl. 248—400 5 Claims



An energy storing device for installation in a column base for height adjustable furniture provided with a member having a conical aperture attached to the piece of furniture, a cone provided at the upper end of the device for frictional engagement with the aperture, a release pin extending into said member, the cone being formed in one piece on the housing of the device and having a transition zone between the external conical part and the housing.

3,790,120

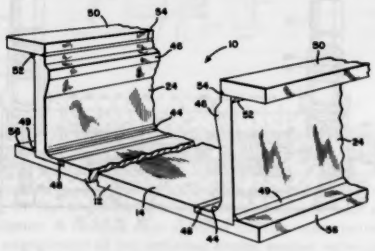
COMPOSITE SLAB CASTING FORM

Mark J. Wise, Brookville, Ohio, assignor to The Flexicore Co., Inc., Dayton, Ohio

Filed Dec. 13, 1971, Ser. No. 207,190

Int. Cl. B28b *7/22*

U.S. Cl. 249—50 17 Claims



A form for casting prestressed concrete slabs which are intended to provide an integral, finished ceiling when installed. The base or pan of the form is constructed as a relatively heavy plate to resist deflection, particularly transversely of a form, when the form is filled with concrete. The upper surface of the pan is machined with great accuracy to provide a pair of notches each having straight, flat walls extending longitudinally of the pan. A pair of side plates are machined to provide each with a side leg joined by a smoothly curved section to an inwardly extending base leg, and the side plates are positioned in the notches. Aligning forces are applied to the side plates in the direction of the outer side walls and bottom walls of the notches to straighten the side plates and pan, if necessary, and the plates are then fixed in the pan by welding. When the side plates are thus assembled on the pan the base legs extend inwardly of the form from the curved sections and the inner ends of the base legs, together with inner side walls of the notches, define cavities which are filled with a welding material. The welding material is then ground flat to provide a smooth transition surface between the upper surface of the pan and the upper surface of the base leg. Because the base legs extend a distance inwardly of the form from the curved sections, the welding material in the cavities may be ground without gouging the curved connecting sections or other surfaces of the form.

3,790,121

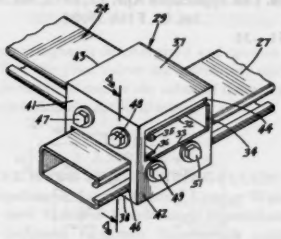
COLUMN FORM AND CLAMP ASSEMBLY

Wally O. Sels, and Alfred L. Paul, both of Minneapolis, Minn., assignors to Brock-White Co., Minneapolis, Minn.

Division of Ser. No. 145,333, May 30, 1971, Pat. No. 3,724,801. This application Nov. 15, 1972, Ser. No. 306,700

Int. Cl. E04g *13/02*

U.S. Cl. 249—219 R 4 Claims



A form usable to construct a concrete column is held in a closed position by a number of clamp assemblies surrounding the form. Each clamp assembly has two pairs of channel bars held in adjustable right angle relationship with a corner bracket unit. A single pivot joins one bar of each pair of bars together. A quick release connector holds the other bars of each pair of bars together.

3,790,122

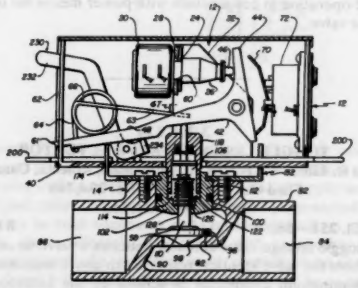
ZONE CONTROL VALVE ASSEMBLY

Richard Weinstein, Evanston, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 80,011, Oct. 12, 1970, Pat. No. 3,711,060. This application Apr. 17, 1972, Ser. No. 244,709

Int. Cl. F16k *31/00*

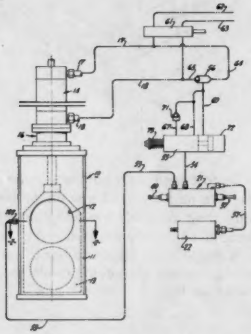
U.S. Cl. 251—11 6 Claims



Valve assembly for zone control valves of the type employed in hydronic temperature control systems. The valve in-

corporates a control unit which can readily be separated from the valve structure without emptying fluid from the system. An improved sealing structure protects the valve itself and allows the separation noted above and permits sealing structure itself to be replaced without emptying system fluid. In this way, the control unit and the valve seals can be replaced readily in the field, are long-lived, and capable of continuous trouble-free usage. Variations in the control of the heating system are also shown.

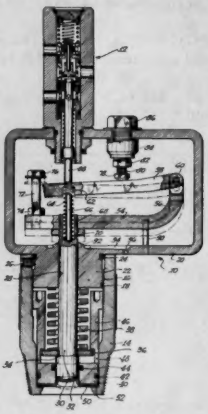
3,790,123
VALVE APPARATUS AND METHOD
Marvin H. Grove, and Rodney A. Wailes, both of Houston, Tex., assignors to M & J Valve Company and M & J Development Company, both of Houston, Tex.
Continuation-in-part of Ser. No. 162,806, July 15, 1971, abandoned. This application Apr. 17, 1972, Ser. No. 244,398
Int. Cl. F16k *39/04*
U.S. Cl. 251—31 **11 Claims**



Valve apparatus and method using a valve (gate or ball type) which has one or more seat rings together with means for jacking the rings against the movable valve member. The jacking means is operatively connected to a loading device exterior of the valve body and arranged whereby the jacking force can be relieved to facilitate operation of the valve. Various embodiments are shown involving both manual and automated operation in conjunction with power means for operating the valve.

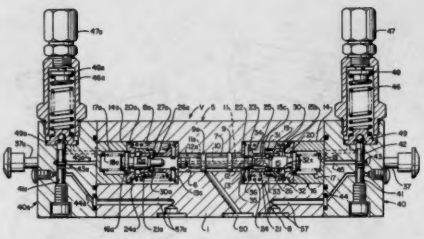
3,790,124
TOGGLE LINKAGE VALVE ACTUATOR
James R. Ellett, 9211-75th St., Edmonton, Alberta, Canada
Filed Oct. 3, 1972, Ser. No. 294,749
Int. Cl. F16k *31/165*
U.S. Cl. 251—58 **8 Claims**

A toggle linkage valve actuator actuates a valve so as to obtain from the valve identical responses to above-maximum and below-minimum conditions as sensed by the actuator. The sensed condition is translated into mechanical movement of a piston and yoke assembly to which is pivotally attached a toggle bar biased away from the yoke but limited in its separation therefrom by a first adjustment means. Movement of the assembly away from the valve elicits the desired response as the toggle bar is mechanically connected to the valve. Movement of the assembly towards the valve brings the toggle bar into



contact with a second adjustment means which reverses the direction of the toggle bar movement, thereby eliciting the same desired response from the valve.

3,790,125
CONTROL VALVE WITH POWER ACCUMULATING, SNAP ACTION, SPOOL DRIVE
Eugene E. Swatty, Euclid, Ohio, assignor to Fluid Controls, Inc., Mentor, Ohio
Filed Oct. 31, 1972, Ser. No. 302,488
Int. Cl. F16k *31/56*
U.S. Cl. 251—75 **10 Claims**



The spool of a fluid control valve is movable axially from a first position to a second position with a snap action by a power accumulator to which predetermined external power is applied. While the spool remains in its first position, the accumulator is driven by the externally applied force to a firing position. As it progresses toward firing position it accumulates and stores a progressively greater amount of power in condition for instant application. The amount of the stored power which it has accumulated when it has reached firing position is sufficient so that, upon firing, it drives the spool with a snap action from the first position, to the second position. The spool is returned to the first position upon release of the external power applied to the accumulator. The return of the spool may be effected by a spool return member driven by a return spring which has been energized by the accumulator as the accumulator has moved to its firing position. In such case, the return member and return spring act as a second accumulator.

Firing of the first accumulator latches the return member and holds the spring in energized condition. Upon discontinuance of the application of power to the first accumulator after firing, the first accumulator is restored to its original position and, upon restoration, unlatches the spool return member. Thereupon the return spring fires and drives the spool to its first position with a snap action. Alternatively, instead of the return of the spool by the spool return member and return spring, the spool may be returned by another accumulator which corresponds functionally to the first accumulator and operates in sequential relation to the first accumulator so that the spool is driven with a snap action from the first position to the second position by one accumulator and is returned from the second position to the first position by the other accumulator. The accumulators can be controlled for automatic successive repetitive reversals of the spool.

3,790,126

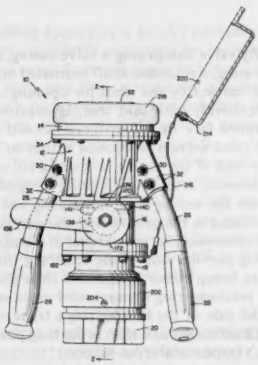
SINGLE POINT REFUELING NOZZLE

Paul R. Ostand, and Robert W. Guertin, both of Cincinnati, Ohio, assignors to Dover Corporation, New York, N.Y.

Filed Nov. 3, 1971, Ser. No. 195,173

Int. Cl. F16k *35/00*

U.S. Cl. 251—89.5 **16 Claims**



A single point refueling nozzle for cooperatively engaging the adapter on an aircraft wing so as to permit fueling or defueling of the aircraft is disclosed. The single point refueling nozzle provides cooperatively locking members which prevent opening of the nozzle poppet valve until engaged with the wing adapter. A floating dual cylinder configuration permits sealing engagement of the refueling nozzle poppet valve plus sealing engagement of the nozzle and the underwing adapter by use of a novel nose seal, mounted in the cylinder, which is easily replaceable when damaged or worn. An over-the-center lever arm construction permits locking the poppet valve in the open and closed position.

3,790,127

HYDRAULIC VALVE

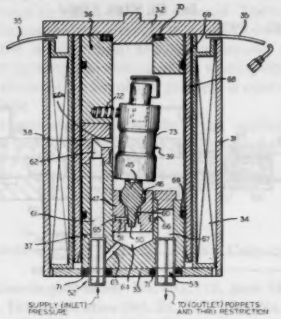
Raymond G. Reip, Clarendon Hills, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Nov. 3, 1972, Ser. No. 303,354

Int. Cl. F16k *31/02*

U.S. Cl. 251—129 **13 Claims**

An intrinsically safe hydraulic valve including a first stage in the form of pilot valves and a second stage in the form of a poppet valve assembly. The poppet valve assembly includes first and second pairs of piston operated poppets which, when selectively operated, control the drive direction of a fluid motor. The pilot valves are electrically controlled through an electromagnet arrangement wherein the valves are closed



when the electromagnet is de-energized and opened when it is energized. When the pilot valves are selectively opened, they apply a pilot pressure to one or the other of the pairs of piston operated poppets to drive the fluid motor.

3,790,128

DEVICE FOR TRANSFERRING FLUIDS

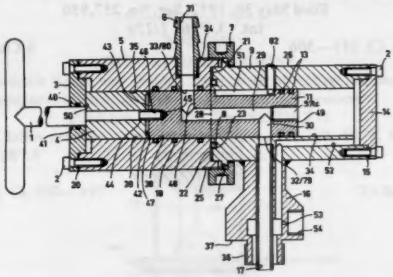
Wilhelm Hempelmann, Leopoldshafen; Gunter Waldenmeier, Karlsruhe, and Manfred Kienhofer, Leopoldshafen, all of Germany, assignors to Argus Gesellschaft mbH, Ettlingen/Baden, Germany

Filed Oct. 21, 1971, Ser. No. 191,364

Claims priority, application Germany, Mar. 4, 1971, 2110320

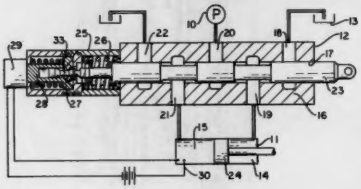
Int. Cl. F16l *35/00*

U.S. Cl. 251—148 **8 Claims**



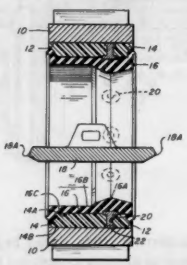
A device for transferring fluids, either in liquid or gaseous form, from one space to another comprises two hollow cylindrical valve bodies, each provided with a radial nipple serving as inlet and outlet respectively, and releasably connected with each other in axial alignment and containing each an axially movable piston releasably connected with each other by a thread on one end of a rod which projects axially from one end of one of said hollow cylindrical valve bodies and has a handle on the outwardly projecting end for manually pushing the combined pistons, which are provided with channels, from one end position in which the channels connect said two nipples with each other to another end position in which said channels are out of communication with said nipples.

3,790,129
VALVE DETENT MECHANISM
Charles W. Pauls, Norman, Okla., assignor to The Cessna Aircraft Company, Wichita, Kans.
Filed July 15, 1971, Ser. No. 162,876
Int. Cl. F16k 31/04
U.S. Cl. 251—297 6 Claims



A solenoid-operated detent mechanism for a spool valve having a spring centered neutral position and a detented operating position. The mechanism includes a locking device in the form of a movable solenoid armature having a cam surface locking the detent balls in engagement with grooves in the spool in the detented position and releasable when energized to permit the spool centering spring to return the spool to neutral. One embodiment contemplates a longitudinally moving armature spring biased in one direction to urge detent balls radially into a spool detent groove and pulled oppositely by the solenoid upon actuation to release the balls. Another embodiment has a rotating armature that through a cam surface lifts radially spring-pressed detent pawls from the spool groove.

3,790,130
SEAT FOR BUTTERFLY VALVES
John A. Getty, Jr., Tulsa, Okla., assignor to Dover Corporation, Tulsa, Okla.
Filed May 30, 1972, Ser. No. 257,950
Int. Cl. F16k 1/226
U.S. Cl. 251—306 6 Claims

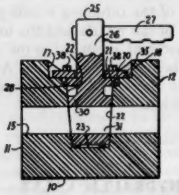


An improved seat for a valve having an outer tubular liner of relatively hard, inflexible material, an inner tubular member of resilient material bonded to the outer liner internal circumferential surface and thermal communication means between the outer circumferential surface of the liner and the inner member whereby in securing the inner member to the outer liner improved bonding is obtained.

3,790,131
BUTTERFLY VALVE
Donald K. Hagar, Macungie, Pa., assignor to Masser Industries Incorporated, Allentown, Pa.
Filed Sept. 1, 1972, Ser. No. 285,931
Int. Cl. F16k 1/226
U.S. Cl. 251—306 10 Claims

A butterfly valve comprising a valve casing, an annular seat within the casing, a rotatable shaft journaled in the casing, and a valve disc carried by the shaft for opening and closing the valve cooperatively with said seat, is improved by the seat being the inner face of a four-faced, closed sealing ring of trapezoidal cross-section positioned within an annular groove in the inner wall of the casing, a four-faced, closed retaining ring of trapezoidal cross-section being wedged in the annular groove beside the sealing ring, the sealing and retaining rings being so oriented in the groove that the parallel sides of their trapezoidal cross-sections are parallel to the axis of the casing, with the long parallel side of the retaining ring's trapezoidal cross-section being closer to the axis than the short parallel side of the retaining ring's trapezoidal cross-section, and the short parallel side of the sealing ring's trapezoidal cross section being closer to the axis than is the long parallel side of the sealing ring's trapezoidal cross-section.

3,790,132
VALVE
Emil S. Schmitt, P. O. Box 493, 400 Old Penllyn Pk., Penllyn, Pa.
Filed July 14, 1972, Ser. No. 271,834
Int. Cl. F16k 5/04
U.S. Cl. 251—312 7 Claims



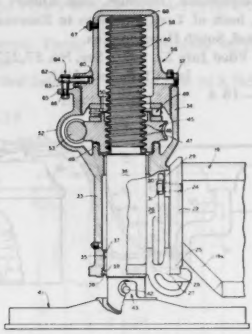
A corrosion resistant valve of the stopcock type is provided, the valve body and valve plug preferably being of Teflon, the plug being tapered with an integral resilient cup or flange at the lower end engaging an inner face in the valve body, a clamping plate urging the valve plug downwardly against the resilient action of the lower end flange by engagement with an upper shouldered flange which is seated in a bore in the body.

3,790,133

OUTRIGGER JACK ASSEMBLY

Cecil E. Jones, Columbus, Ohio, assignor to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 27, 1971, Ser. No. 211,892
Int. Cl. B60s 9/02
U.S. Cl. 254—86 R 6 Claims



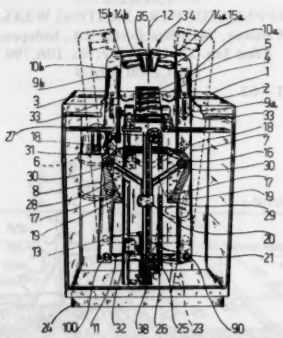
Material handling apparatus is hereby provided with a plurality of laterally extendable outriggers for increasing the stability of the apparatus. Each outrigger includes a beam which is provided at each end with a vertically adjustable jacking mechanism. Each jack includes a vertical shaft which has a screw thread at its upper end and carries a ground engaging float at its lower end. The threaded end of the shaft is received in an internally threaded drive ring which has a worm gear on its exterior. A hydraulic motor drives a worm that meshes with the worm gear to extend and retract the shaft, and thus raise and lower the float. The combination of the screw thread on the vertical shaft and the worm drive mechanism results in the jack being locked when the motor is off and thus avoids slipping in the jack mechanism under load.

3,790,134

APPARATUS FOR INSPECTING AND CHECKING THE CONDITION OF A TIRE CASING

Claudio Matteuzzi, n. 15/6 Via Olmetola, Bologna, Italy

Filed Mar. 22, 1972, Ser. No. 236,903
Int. Cl. B60c 25/14
U.S. Cl. 254—50.2 3 Claims



An improvement in a tire casing inspection machine having a continuous moving belt on which the tire is supported in perpendicular relation and rotated and gripping means resting on the bead move the side wall of the casing outwardly or inwardly by means of moving arms.

An adjusting unit is provided which is movable upwards and downwards on a vertical rod perpendicular to the moving belt. Inclined planes are machined into the moving arms, which are secured to a brace, the movement of the said unit determining, in an initial stage, the linear translation of the moving arms and of the brace to which they are secured. The consequent vertical positioning of the grippers is thereby controlled with respect to the moving belt and, in a second stage, the synchronized opening and closing of the moving arms and the consequent identical action of the grippers is controlled on a horizontal plane.

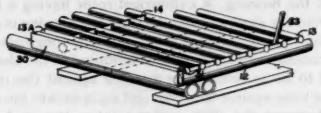
Means are provided whereby the force applied to force apart the side walls of the casing is proportioned to the flexibility of these walls.

3,790,135

CATTLE GUARD

Lee H. Christianson, 43 Holly St., N.W., Calgary, Alberta, Canada

Continuation-in-part of Ser. No. 152,755, June 14, 1971, abandoned. This application Oct. 24, 1972, Ser. No. 300,247
Int. Cl. A01k 3/00; E01b 17/00
U.S. Cl. 256—17 4 Claims



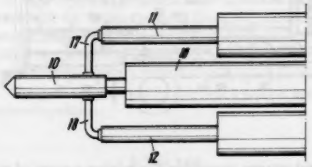
A plurality of spaced and parallel cross member pipes are secured at right angles to a plurality of sill members. A steel gusset is vertically situated between adjacent cross member pipes and upon each sill member and is welded thereto thus preventing the cross member pipes from breaking away from constant battering received from logging trucks and the like using the cattle guards. The gussets have concave ends which fit around the periphery of the pipes and engage the pipes well above the horizontal centre line thus giving a structure which is virtually incapable of being broken in use.

3,790,136

DIE CASTING MACHINE

Friedrich Koch, and Hubert Zeug, both of Achim, Germany, assignors to Desma-Werke GmbH, Achim, Germany

Filed Jan. 26, 1972, Ser. No. 220,771
Claims priority, application Germany, Jan. 29, 1971, P 21 04 087.9
Int. Cl. B01f 7/08
U.S. Cl. 259—192 2 Claims



A die casting machine is intended for sprayable materials, particularly artificial materials. The material is plastified in separate devices, particularly in an extruder and is supplied therefrom to a spraying aggregate which sprays the plastified material through an injection piston into the hollow space of a die cast mould. The invention is particularly characterized in that the injection piston is a rotary worm piston.

3,790,137

ROTATING PNEUMATIC VIBRATOR

Theodore S. Wadensten, 28 Snyder Ave., Ramsey, N.J.

Continuation-in-part of Ser. No. 42,791, June 2, 1970, Pat. No. 3,638,914. This application May 14, 1971, Ser. No. 143,451. The portion of the term of this patent subsequent to Feb. 1, 1989, has been disclaimed.

Int. Cl. B01f *11/00*; F01c *21/02*

U.S. Cl. 259—1 R 6 Claims

A rotating pneumatic vibrator in which a cylindrical housing is provided with an axial shaft spaced inwardly from the walls of the housing to provide a circular space between the shaft and the housing. A cylindrical rotor having a diameter greater than the shaft and smaller then the housing is mounted on the shaft for movement thereabout. A longitudinally extending radially moveable vane is mounted in the shaft and is arranged to be pneumatically pressed against the rotor. Air forces the vane against the rotor and escapes into the chamber formed between the shaft and the rotor, the air forces the rotor to move about the shaft and then escapes to the atmosphere with the rotor and vane returned to their beginning point. The motion is continuous and produces vibrations due to the movement of the rotor on the shaft.

Replaceable circular wear plates are fitted in each end of the housing to seal the ends of the rotor to prevent leakage.

3,790,138

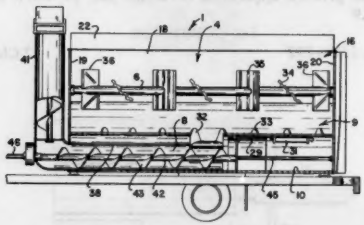
FEED MIXER

Benjamin R. Neier, Dodge City, Kans., assignor to B/J Manufacturing Co. Inc., Dodge City, Kans.

Filed June 19, 1972, Ser. No. 263,962

Int. Cl. B01f *7/04*, *15/02*, *7/08*

U.S. Cl. 259—41 12 Claims



A material mixing apparatus for mixing a mass of materials to form a feeding ration for animals includes spaced elongated augers within a lower portion of a mixing chamber and spaced elongated agitators within an upper portion of the mixing chamber and having at least two sets of paddles thereon. The augers each have flights thereon to move materials along a bottom portion of the mixing chamber and toward an area of mutual convergence located adjacent a normally closed entrance to a passage having a conveyor therein to discharge mixed materials received from the mixing chamber. The augers and agitators are rotated at different speeds to thoroughly blend the mass of material within the mixing chamber and direct same toward a portion of the mixing chamber between said agitators.

3,790,139

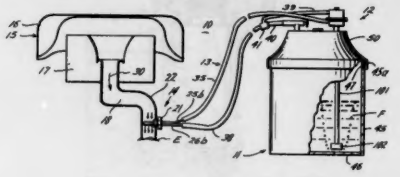
INJECTOR APPARATUS

Robert A. Stephenson, Houston, and Robert M. Zoch, Jr., Dickinson, both of Tex., assignors to Enercon Corporation International, South Houston, Tex.

Filed July 22, 1970, Ser. No. 57,227

Int. Cl. Fo2m *25/02*

U.S. Cl. 261—18 A 4 Claims



The present apparatus has different combined elements depending on the pressure differential developed between a tube positioned in an air intake manifold system for a compression engine and the ambient atmosphere.

If the pressure differential is adequate to provide fluid flow through the fluid reservoir into the air manifold, a regulator member is positioned with the container to control the fluid flow.

If the pressure differential is not adequate to provide fluid flow through the fluid reservoir into the air manifold, a flow tube connected with the container is positioned in the air manifold to develop sufficient pressure differential.

If the air manifold pressure is greater than that of the ambient atmosphere, an impact tube connected with the container is placed upstream of the flow tube to develop adequate pressure differential by forcing air into the fluid container.

Additionally, a check valve may be positioned with the container to prevent fluid flow from the air manifold to the fluid container.

Finally, a needle valve may be positioned with the container to constantly regulate the fluid flow from the fluid reservoir to the engine air manifold.

3,790,140

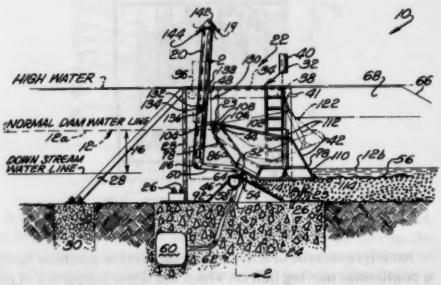
APPARATUS FOR AERATING WATER

Robert W. Conway, 7450 Brecksville Rd., Independence, Ohio

Filed Jan. 22, 1971, Ser. No. 108,790

Int. Cl. B01f *3/04*

U.S. Cl. 261—62 3 Claims



Apparatus for aerating a stream of water under a natural pressure head that comprises a venturi including upper and

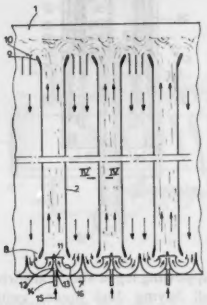
lower gate members connected to the atmosphere for restricting the flow of water. One of the gate members is movable with respect to the other. A foraminous air diffuser is positioned between the upper and lower gate members. A screen is positioned downstream of the upper gate for retarding movement of the air bubbles produced to the water surface.

3,790,141

APPARATUS FOR PRODUCING A FLOW IN A LIQUID MIXTURE

Andre Champeau, Paris, France, assignor to Creusot-Loire, Paris, France

Filed July 19, 1971, Ser. No. 163,765
Int. Cl. B01f *3/04*
U.S. Cl. 261—77 **9 Claims**



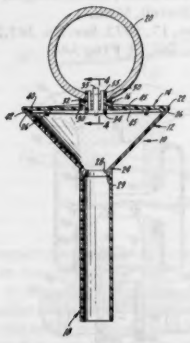
Apparatus for circulating a liquid mixture such as a water/paraffin mixture for aerobic fermentation, which includes a parallelepiped vessel, parallel vertical partitions spaced from the top and bottom of the vessel and defining flow paths, gas injection means at the foot of some flow paths to establish upward flow therein and guide vanes to promote flow from flow paths of one direction to the flow paths for return flow.

3,790,142

GAS DIFFUSER

Brian L. Goodman, Overland Park; Robert B. Higgins, Olathe, and Frank M. Denham, Overland Park, all of Kans., assignors to Ecodyne Corporation, Chicago, Ill.

Filed May 26, 1972, Ser. No. 257,123
Int. Cl. B01f *3/04*
U.S. Cl. 261—124 **10 Claims**



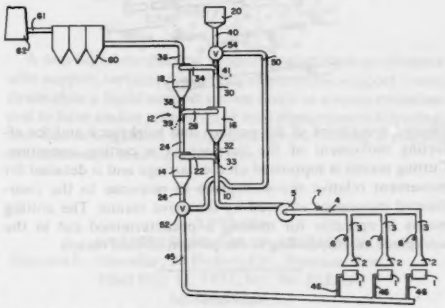
A gas diffuser including a conically-shaped diffuser cone having a plurality of openings formed along the base circumference of the cone for liberating small gas bubbles. Connected to an opening formed in the apex of the cone is a hydrostatic leg depending therefrom. The length of the hydrostatic leg is designed such that during normal operation no gas will pass therethrough. The openings in the diffuser cone include an outer entrance opening and a recessed inner entrance opening. The inner opening is of square shape to release a small bubble. The top of the diffuser cone includes a unique seat and latch connecting arrangement that enables the diffuser to be installed in an opening in gas header pipes of varying diameters.

3,790,143

REMOVAL OF FLUORIDES FROM GASES

Thomas B. Nix, Baton Rouge, La., assignor to Fuller Company, Catasauqua, Pa.

Filed July 31, 1972, Ser. No. 276,492
Int. Cl. C22b *21/06*
U.S. Cl. 266—16 **4 Claims**



A method and apparatus for removing gaseous fluorides from gases evolved from an aluminum smelting furnace. Basically, the fluorides are removed by achieving intimate contact between finely divided particles of alumina and the fluoride-containing gases. This is achieved by feeding the particles of alumina into a stream of gases collected from the aluminum smelting furnaces countercurrent to the flow of gases. The particles of alumina adsorb the fluorides. The particles of alumina and adsorbed fluorides are then separated in a gas-solids separator, such as a cyclone and the alumina may then be fed to the smelting furnaces. Preferably, two stages are used. The gases supplied to the second or last cyclone in the direction of gas flow are supplied with new alumina countercurrent to the flow of gases. The alumina particles removed in this second cyclone are conveyed to the gas stream supplied to the first cyclone in the direction of gas flow. In a two-stage apparatus, these gases will be those evolved from the smelting furnace. The alumina separated from the first cyclone may be either conveyed to the smelting furnace or recirculated or a portion may be recirculated and a portion conveyed to the smelting furnace. The gases separated in the first cyclone are conveyed to the second cyclone.

3,790,144

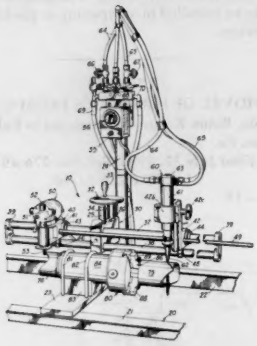
TUBE AND PIPE CUTTING MACHINE

David W. Waldron, Valdosta, Ga., assignor to Lowndes Engineering Co., Inc., Valdosta, Ga.

Filed Jan. 10, 1972, Ser. No. 216,394
Int. Cl. B23k *7/04*
U.S. Cl. 266—23 E **2 Claims**

Apparatus for use in making a predetermined cut on a tubular workpiece corresponding to pattern control means. The apparatus includes a base frame for supporting a workpiece

and a pattern in fixed relationship with each other, with the supporting means detailed to permit coordinated movement of the workpiece and pattern relative to the base frame means. A carriage assembly is supported on the base frame for movement relative thereto and movement relative to the workpiece and pattern. The carriage assembly includes a drive means operatively associated with the pattern for effecting the coordinated movement of the pattern and workpiece and for effecting movement of the carriage in a cutting operation. Cutting means is supported on the carriage and is detailed for movement relative the workpiece in response to the coordinated movement effected by the drive means. The cutting means is operable for making a predetermined cut in the workpiece corresponding to the pattern control means.



3,790,145

DEVICE IN A MELTING OR HOLDING FURNACE FOR FACILITATING THE CHARGING THEREOF

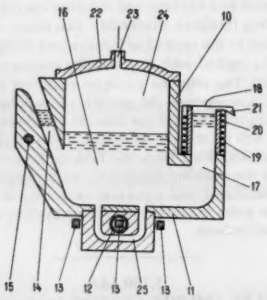
Kuido Gering, Vasteras, Sweden, assignor to Granges-Essen AB, Vasteras, Sweden

Filed June 7, 1971, Ser. No. 150,595

Claims priority, application Sweden, June 10, 1970, 8065/70

Int. Cl. C21c *5/52*

U.S. Cl. 266—33 R **5 Claims**



A device in a melting or holding furnace for facilitating the charging of the furnace, said device comprising an upwardly directed charging duct ouside of the furnace and in communication with the frunace at the lower portion thereof, the charging duct at its upper end being provided with a device for stirring of the molten material in the charging duct.

3,790,146

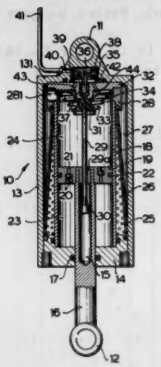
FLUID FILLED SUPPORTING LEG

Hans-Juergen Hoffmann, Schalksmuehle-Heedsfeld; Manfred Loehr, Letmathe, and Hubert Pfannkuche, Lichtendorf, all of Germany, assignors to Hoesch Werke AG, Dortmund, Germany

Filed Oct. 24, 1972, Ser. No. 300,377

Int. Cl. B60g *15/12*

U.S. Cl. 267—64 R **10 Claims**



A fluid filled supporting leg or shock absorber has a cylinder with an end wall having duct means connecting a valve chamber into which a pressure conduit opens, with a working chamber formed in the cylinder by a piston having throttling ducts therethrough. A lifting valve for up-regulation is located in a duct and has a portion in the working chamber cooperating with a control valve for down-regulation, which is coupled with the piston in a predetermined relative position of piston and cylinder. The lifting valve is held in an open position by the control valve during up-regulation so that fluid flows into the working chamber until the control valve is coupled with the piston, and is moved away from the lifting valve which stops the flow into the working chamber. When the piston is moved during down-regulation to reduce the working chamber, fluid flows therefrom into the pressure conduit until the control valve is moved by the piston to a position closing the duct means.

3,790,147

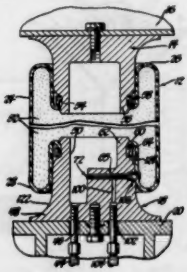
HEIGHT CONTROL VALVE FOR AIR SPRING WITH END PISTON-BOOT OPERATED

Robert E. Owen, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1972, Ser. No. 307,218

Int. Cl. F16g *5/00*

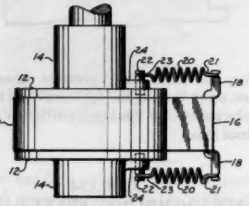
U.S. Cl. 267—65 B **5 Claims**



A height control valve assembly for a vehicle leveling system includes an air spring having a resilient rolling lobe

which rolls onto and off of a bell-shaped surface of an air spring piston. A height control valve in the piston is operated by the air spring lobe as it rolls onto and off of the piston to control the amount of air pressure within the air spring.

3,790,148
TENSION RING FOR COMPRESSOR VANE
Thomas J. Bellmer, Stanhope, N.J., assignor to Fedders Corporation, Edison, N.J.
Filed Mar. 31, 1972, Ser. No. 240,251
Int. Cl. F16g *1/12*
U.S. Cl. 267—73 **10 Claims**

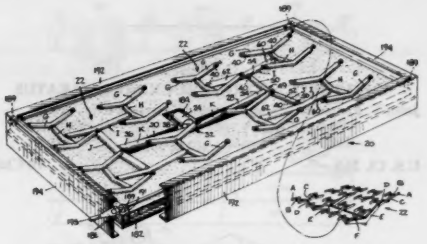


A hollow cylindrical body and two end walls define a compression chamber in which a rotor is disposed. Hubs are formed on the outer sides of the end walls for receiving a pair of tension rings. A vane is disposed in a radial opening formed in the body and engages the rotor for dividing the chamber into high and low pressure sides. The vane is held in engagement with the rotor by a pair of coil springs disposed between the outer end of the vane and the tension rings.

3,790,149
SPRING CONSTRUCTION
Lawton H. Crosby, Lake Bluff, Ill., assignor to Morley Furniture Spring Corporation, Chicago, Ill.
Filed Apr. 26, 1971, Ser. No. 137,563
Int. Cl. F16f *1/46*
U.S. Cl. 267—110 **36 Claims**

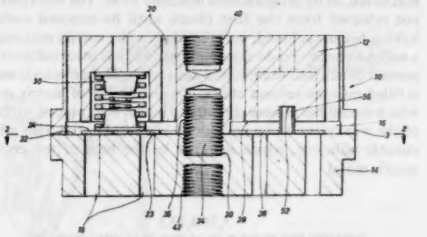
Attachment apparatus for joining sinuous spring bands to the frame rails in furniture or the like. Anchor link members and radius link members are employed, alone or in combination with each other, to connect the free ends, either plain or Zee-hooked, to the rail at or below the rail top. The link members are color-coded according to length and stocked in a multi-compartment working container having corresponding color-coded compartments. Any desired length link or combination of links are readily selected by color reference.

3,790,150
MECHANICAL SUPPORT SYSTEM
Donald Ernest Lippert, Woolwich, Maine, assignor to Deres Development Corporation, Greenwich, Conn.
Filed Sept. 25, 1970, Ser. No. 75,373
Claims priority, application Great Britain, Oct. 4, 1969, 48860/69
U.S. Cl. 267—151 **58 Claims**



A non-liquid mechanical support system having a displaceable support surface, comprising displaceable support means, to simulate a liquid support system (such as a water container) and to have similar properties of load displacement featuring a tree-like arrangement of branched levers forming a plurality of displaceable load support points.

3,790,151
COMPRESSOR VALVE ASSEMBLY
Bernard L. Schwaller, 28 Hedwig Cir., Houston, Tex.
Filed May 11, 1972, Ser. No. 252,367
Int. Cl. F16f *3/02*
U.S. Cl. 267—151 **13 Claims**



A compressor valve assembly comprising a guard body member and a seat body member that cooperate to form a valve chamber and to define flow passages extending through the valve that are disposed in intersecting relation with the valve chamber. The seat body portion of the valve defines seating surfaces that are engaged by a pair of ring closure elements that are urged into seating relation with the seat surfaces by spring elements. A plurality of guide elements are retained within a guide retaining groove formed in the guard member and are disposed between the ring closure elements and serve to guide both of the ring closure elements during movement thereof. The guide elements also serve to properly position the ring closure elements in the closed position thereof to obstruct the flow of fluid through a valve assembly. Each of the guide elements comprises a strip of wear and heat resistant resilient sheet material bent back upon itself to define curved elongated portions adapted for guiding engagement with peripheral guide surfaces formed on the ring clo-

sure elements. The guide elements are structured to cooperate with the guard element in such manner that lateral movement of the guide elements is prevented during operation of the valve. The free extremities of the elongated portions of the guide elements may be curved away from the respective ring closure member thereby presenting a rounded surface to the ring closure member that prevents excessive wear and provides effective guiding.

3,790,152

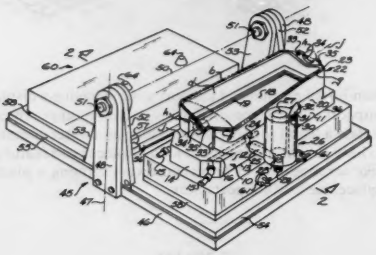
MELTABLE MATRIX CHUCKING APPARATUS

John T. Parsons, 205 Wellington, Traverse City, Mich.

Filed Apr. 1, 1971, Ser. No. 130,218

Int. Cl. B23q *3/00*

U.S. Cl. 269—7 **10 Claims**



Chucking apparatus of the meltable matrix type. A first heat-conductive metal chuck body, fenced with rubber, has a workpiece locator support which establishes an axis below which molten matrix metal is filled, and relative to which two opposite surfaces of a workpiece may be successively machined, as by programmed machine tools. The workpiece is not released from the first chuck until its exposed surface, having been machined, is embedded in the matrix material of a second chuck. To do this, the first chuck is inverted over the second chuck and maintained cool while molten matrix metal is filled into the second chuck. To permit use of matrix metal which would not adhere directly to metal workpieces, surfaces of the workpiece to be embedded are first coated with a heat curable adhesive, which is cured by the heat of the cooling matrix metal.

3,790,153

EQUIPMENT FOR HOLDING WORKPIECES

Heinz Seidenfaden, Varel/Oldb, Germany, assignor to Vereinigte Flugtechnische Werke-Fokker Gesellschaft mit beschrankter Haftung, Bremen, Germany

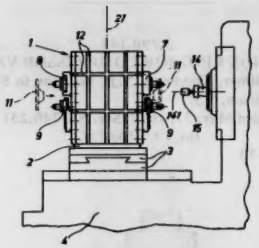
Filed Oct. 24, 1972, Ser. No. 299,996

Claims priority, application Germany, Oct. 27, 1971, 2153463

Int. Cl. B25b *11/00*

U.S. Cl. 269—21 **8 Claims**

Equipment for mounting workpieces in relation to a machine tool axis as pertaining to the spindle of a cutting, milling or drilling tool or the like, and on a machine tool table which can be placed in particular position relative to the tool. A support table is mounted on the machine tool table for turning on a second axis, which can be placed by the machine tool table in particular relation to the tool axis; a prism is mounted with one end face on the support table, so that at least two of the prism sides have similar distance from the second axis; at least two of the sides are provided each with an array of threaded fitting bores arranged in regular spacing along two coordinates on the respective side, the bores of the arrays being arranged to have similar position for similar dispositions of the two sides in relation to the tool. The prism sides have second bores respectively between four of the fitting bores as forming a quadrilateral, and suction into the second bores is



provided for; the sides have grooves interconnecting the second bores; upon turning the table, each of the prism sides is selectably placeable into the same particular position in relation to the tool axis.

3,790,154

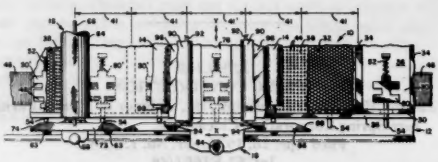
APPARATUS FOR HOLDING SHEET MATERIAL AND OTHER OBJECTS DURING WORKING

Heinz Joseph Gerber, and David R. Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology, East Hartford, Conn.

Continuation of Ser. No. 7,462, Feb. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 821,780, May 5, 1969, Pat. No. 3,495,492. This application Dec. 17, 1971, Ser. No. 209,394

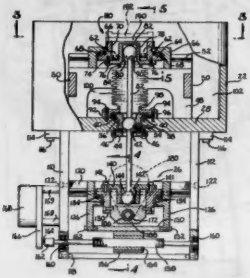
Int. Cl. B23q *3/06;* **B26d** *7/02*

U.S. Cl. 269—22 **17 Claims**



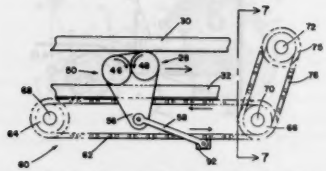
Apparatus for holding sheet material and other objects during cutting or other work thereon includes a vacuum hold-down device having a supporting surface including a plurality of vacuum openings passing therethrough. A vacuum chamber associated with the supporting surface applies a vacuum through the vacuum openings to the sheet material or other object or objects received thereon. A sheet or panel of substantially air-impervious sheet material, such as a sheet of thin polyethylene, is spread over the exposed surface of the work and cooperates with the vacuum to draw the work toward the supporting surface and, if it is compressible, into a more compact condition. The air-impervious panel used with the vacuum may be an expendable sheet of such material spread entirely over the surface of the work prior to working thereon and/or may be one or two continuous belts of such material located in front of and/or behind an associated tool. In cases where the work is a layup of garment fabric, the vacuum and air-impervious panel may also be used to hold the layup in a compact condition for a long period of time between the laying up process and the cutting or other work process to prevent the various layers of the layup from shifting, flowing or otherwise moving relative to one another so as to depart from their relative positions as initially laid up.

3,790,155
X-Y TABLE FOR VACUUM SYSTEMS
Robert Gail Longamore, Newbury Park, Calif., assignor to Radiant Energy Systems, Inc., Newbury Park, Calif.
Filed July 17, 1972, Ser. No. 272,430
Int. Cl. B23q 3/18
U.S. Cl. 269—60 13 Claims



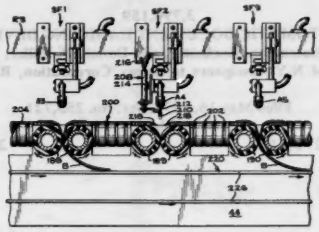
X-Y tables for use in a vacuum system whereby accurate two dimensional movement of a table within the vacuum system may be readily achieved in a repeatable and reliable manner without distrupting or contaminating the vacuum environment. The table within the vacuum system is mounted so as to be translatable in orthogonal directions and is coupled to an external drive system so as to be driveable by conventional means such as lead screws and the like. Integrity of the vacuum system is maintained by a bellows isolating the external drive system to the internal X-Y table, thereby eliminating the need for lubricants, small clearances and other sources of contamination within the vacuum system.

3,790,156
TEXTILE FOLDING MACHINE
Warren Hogendyk, 4017 Bell N.E., Grand Rapids, Mich.
Filed Feb. 1, 1971, Ser. No. 111,257
Int. Cl. B65h 29/46
U.S. Cl. 270—30 19 Claims



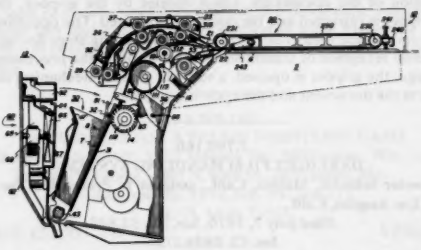
This disclosure relates to a folding machine and specifically to an apparatus for folding textile or like products in a serpentine or sinuous fashion. Textile products, after having been processed and normalized in the conventional fashion, may be folded for storage, shipment, or further processing purposes. This is accomplished in a folding machine having a pair of rollers arranged for reciprocating movement above a table surface to lay the fabric in a serpentine fashion on the table. The reciprocating rollers are driven by a pair of drive wheels at the ends of the rollers and mounted in horizontal track members having top and bottom drive wheel engaging surfaces. The drive wheels are pivotal within the track member on a yoke assembly so that the direction of travel of the rollers with respect to each other remains constant even as the direction of travel of the yoke assembly changes.

3,790,157
FOLDING MACHINE
Donald C. Crawford, and Orrin H. Besserdich, Green Bay, both of Wis., assignors to FMC Corporation, San Jose, Calif.
Filed May 7, 1971, Ser. No. 141,127
Int. Cl. B65h 45/12
U.S. Cl. 270—62 1 Claim



An article folding machine, especially adapted to fold either a single or multiple lane input of plastic film bags, and capable of multiple folding modes by integral programming controls. Air jets force preselected fold line portions of the moving bags into nip rolls to successively fold each bag upon itself in preselected proportions and in two different directions. Selected folding operations can be bypassed.

3,790,158
AUTOMATIC DOCUMENT HANDLER
James E. Summers, Fairport, and Michael J. Elwood, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 22, 1972, Ser. No. 255,336
Int. Cl. B65h 7/14
U.S. Cl. 271—4 4 Claims



An automatic document handler for supplying documents singly to the platen of a processing apparatus such as a copying machine. Following copying, each document is returned to the document supply where the used documents are kept separated from documents awaiting copying by means of a resettable bail bar. A photoreceptor is used in the return document portion of the document supply area, to determine that each returned document is properly arranged and the feed path is clear for the receipt of the next document. Should the return path become obstructed with a misoriented document, the photodetector operates to stop the document feed system.

To position the documents properly for copying, the document handler includes a register against which the document trailing edge is abutted through reversal of the platen transport belt. To allow the document to be removed and the platen cleared for the next document, means are provided to remove the register and lower a document deflector into an in-

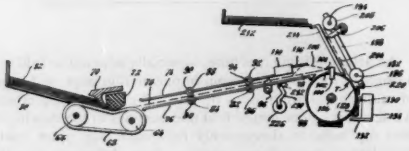
tercept position, the deflector then serving to guide the document into a predetermined return path back to the document supply without interfering with movement of the next document forward. The platen transport comprises an endless belt conveyor supported for substantially single line contact with the platen surface at a point adjacent to and parallel with the register.

3,790,159

AUTOMATIC DOCUMENT HANDLING DEVICE

John F. Hatzmann, Rochester, and Donald P. Miller, Webster, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed May 16, 1972, Ser. No. 253,721
Int. Cl. B65h *3/04, 29/22*
U.S. Cl. 271—4 **26 Claims**



An automatic document handling device is described for use primarily with facsimile transmission systems wherein accurate document positioning is required. A processing drum is provided with a document retention gripper positioned on the surface. In response to an actuation signal the document retention gripper in its retracted position is rotated along with the document processing drum until it is located at a target location. Upon proper positioning the document retention gripper is opened and a document is fed from a supply source to the retention gripper. Suitable switches located along the document feeding path verify the accurate positioning and location of the documents. Upon receipt by the gripper, the gripper is retracted and the document retained. The operating drum surface then rotates through a processing stage for facsimile reception or transmission. At the end of the processing stage, the gripper is opened, a suitable pickoff mechanism rejects the document and the cycle is repeated.

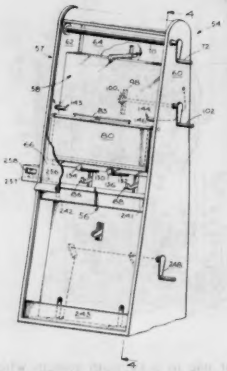
3,790,160

DAYLIGHT FILM HANDLING SYSTEM

Gunter Schmidt, Malibu, Calif., assignor to Production, Inc., Los Angeles, Calif.

Filed July 7, 1970, Ser. No. 52,848
Int. Cl. B65h *3/30*
U.S. Cl. 271—18 R **11 Claims**

A system for enabling X-ray films, of the type primarily used in the dental and medical fields, to be handled in daylight for exposure to X-rays. The system utilizes identical film sheets emulsion coated on one or both faces, each sheet having a notch, displaced from the sheet center line, formed in one edge thereof. A stack of sheets is packed in an opaque envelope with the sheets being alternated so that all of the notches lie along a common stack edge arranged in two parallel rows, the notches in adjacent sheets lying in different rows. The system includes a light tight dispenser which receives the envelope and is capable of being operated to strip the envelope from the film sheet stack. The dispenser includes a pair of rotatable selector cams, each aligned with a different row of notches. A spring mounted back-up plate urges the film sheet stack against the selector cams with the two selector cams respectively bearing against notched and unnotched portions of the top sheet. Means are provided for alternately rotating the two cams so as to successively release the top sheet from the stack into a cassette removably engaged with the dispenser. The cassette includes parallel screens normally spring urged together in light tight relationship when disengaged from the dispenser. Engagement of the cassette with the



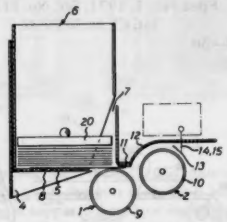
dispenser in light tight relationship urges the screen plates apart to enable the released film sheet to fall therebetween. The cassette in turn operatively cooperates with a processor to enable the film sheet therein to be transferred to the processor.

3,790,161

APPARATUS FOR INDIVIDUALLY FEEDING SHEETS, CARDS, BANKNOTES AND THE LIKE

Konrad E. Ericsson, Stockholm, Sweden, assignor to Arbman Development AB, Stockholm, Sweden

Filed Feb. 14, 1972, Ser. No. 225,910
Claims priority, application Sweden, May 12, 1971, 6143/71
Int. Cl. B65h *3/06*
U.S. Cl. 271—117 **5 Claims**



An apparatus for feeding sheets, cards, banknotes and the like from a stack comprises a rotary roll which engages the lowermost sheet, card or banknote in the stack, a further roll spaced from and preferably slightly above the first roll, and a strip having a rough coating and so arranged between the two rolls as to extend inside a plane tangent to the peripheries of the rolls.

3,790,162

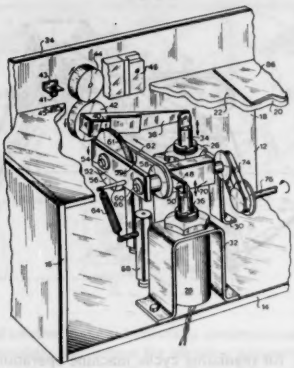
PICKING AND TRANSPORTING APPARATUS AND METHOD

Silas Ray Halbert, 481 Monaco Dr., Melbourne, Fla.

Filed May 15, 1972, Ser. No. 253,594
Int. Cl. B65h *3/06*
U.S. Cl. 271—118 **15 Claims**

Apparatus comprising a member having a surface adapted to receive a stack of articles. Means are provided for rotating

each bottommost article about an axis which is substantially normal to the plane of the surface and then feeding that article



away from the stack, while any remaining articles are restrained in the stack.

3,790,163

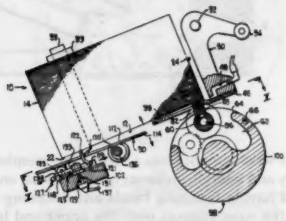
DEVICE FOR MAINTAINING UNINTERRUPTED FEEDING OF BLANKS FROM THE BOTTOM OF A STACK

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Filed Mar. 23, 1972, Ser. No. 237,356

Int. Cl. B65h *1/06, 3/08*

U.S. Cl. 271—165 **5 Claims**



In a device for feeding envelope blanks from the bottom of a stack, the bottom blank is removed from the stack by engaging the front edge of the bottom blank with a blank engaging assembly which engages the front edge and guides it into engagement with a feed cylinder which thereafter transports the bottom blank to other transfer cylinders in the device. Uninterrupted timely engagement of each successive bottom blank in the stack by the engaging assembly is provided by adjustment of a supporting plate while the device is in operation. The plate is arranged to support the stack of blanks and is pivotally connected to the frame of the device. Eccentric adjustment members contacting the underside of the support plate rotate to raise and lower a portion of the plate relative to the disc elements of the blank engaging assembly and prevent movement of the stack of blanks in the forward direction or in the other extreme rearward movement or push back of the bottom sheet by the disc elements.

3,790,164

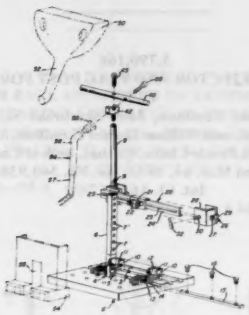
THERAPEUTIC EXERCISE DEVICE

Charles Dennis Flanigan, San Jose, Calif., assignor to Overly Manufacturing Company, Greensburg, Pa.

Filed Feb. 21, 1973, Ser. No. 334,372

Int. Cl. A63b *23/02*

U.S. Cl. 272—57 R **6 Claims**



An improved therapeutic exercise device combining three independently adjustable support means, specifically, independently adjustable foot supports, knee supports, and midriff support, so as to enable accommodation of exercisers of varying sizes. A broad support base is provided including means for engaging and receiving telescoping mast means. The telescoping mast includes a fixed mast portion rigidly engaging the base and a vertically movable mast portion which is vertically adjustable to selected fixed locations on the fixed mast portion. The vertically adjustable mast portion carries at the upper end thereof a horizontal midriff support bar adapted to abut the midriff of an exerciser. Spaced-apart foot support means are provided in the support base and are laterally adjustable to selected locations in said base. Knee support means are provided and are adapted to fixedly engage the fixed mast portion at selected varying vertical locations thereon. Exercisers of varying sizes may thus use the therapeutic exerciser with feet and knees properly supported while exercising by midriff bending about the vertically adjustable midriff support bar.

3,790,165

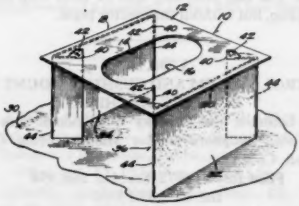
APPARATUS FOR A THUMB WRESTLING GAME

Robert P. Schmidt, 3223 Monaco Dr., Milwaukee, Wis., and Richard S. Menke, 4047 N. 85th St., Milwaukee, Wis.

Filed June 26, 1972, Ser. No. 266,117

Int. Cl. A63b *71/04*

U.S. Cl. 273—1 R **6 Claims**



Game apparatus for playing a game of thumb wrestling employing the thumbs of two opponents includes flexible thumb

jackets which snugly interfit on the thumbs of the opponents and which include representations of wrestling characters. The apparatus also includes a game ring which localizes the wrestling activity of the opponents and interlocks the hands with the ring to keep the ring in physical association with the hands of the players irrespective of movement of the players.

3,790,166

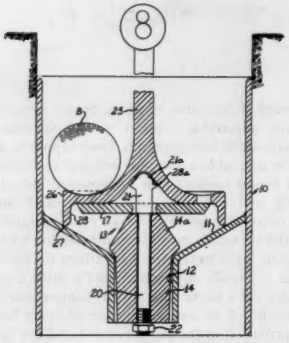
GOLF BALL EJECTOR AND FLAG POST FOR PUTTING CUPS

Georges Edmond Hamilton, 7400 Sherbroke St., West, Apt. 607, Montreal, and William Horace Hamilton, 30 Lakeshore Rd., Apt. 606, Pointe Claire, Quebec, both of Canada

Filed Mar. 14, 1973, Ser. No. 340,938

Int. Cl. A63b *57/00*

U.S. Cl. 273—34 A **9 Claims**



A cylindrical plug is inserted in the central opening in the sloping bottom of a conventional putting cup, the upper portion of the plug projecting above the bottom and terminating in an annular upper edge. An ejector plate in the cup has a central aperture, the edge of which rests rockably on the upper edge of the plug-thus providing a universal fulcrum which permits the plate to be tilted in any direction to eject a golf ball from the cup. A central locating post at the upper end of the plug extends loosely through the aperture in the plate to prevent displacement of the latter. A removable flag post may be used with the cup, the flag post having a circular base which rests on the cup bottom. The base is provided at its underside with a recess which accommodates the ejector plate and the locating post on the plug. When the flag post is removed from the cup, its base enables it to stand upright on the ground. The flag post may also be used with the plug in the putting cup, but without the ejector plate.

3,790,167

CONTROL SYSTEM AND CUSHION MOUNT FOR BOWLING MACHINES

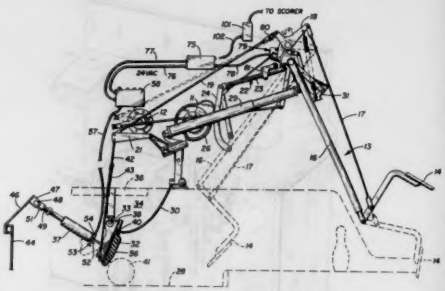
Ronald A. Lenhart, and Timothy W. Rickard, both of Lakewood, Colo., assignors to Zot Manufacturing Company, Lakewood, Colo.

Filed July 3, 1972, Ser. No. 268,394

Int. Cl. A63d *5/00*

U.S. Cl. 273—43 R **11 Claims**

A mechanism for use on automatic pinsetter bowling machines to initiate and regulate the cyclic operations thereof and to better absorb the impact of bowling balls and pins directed against a pit cushion pivotally held in impact absorbing position by improved mounting components. The pressures in a dashpot cylinder on the pit cushion are changed at time of impact, and the pressure change is used to activate control circuits that may include time delay elements, sole-



noids, etc. for regulating cyclic machine operations, such as lane clearing, ball and pin retrieval, game scoring and similar functions.

3,790,168

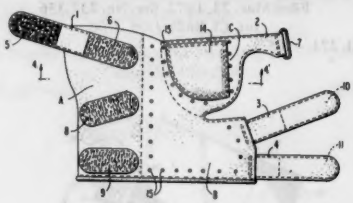
BOWLER'S WRIST SUPPORT

Yoshio Hashimoto, 3-11, 2-chome, Sakuragi-cho, Seima-ku, Kobe-shi, Japan

Filed May 29, 1973, Ser. No. 364,922

Int. Cl. A63b *71/14*

U.S. Cl. 273—54 B **9 Claims**



A bowler's wrist support has a rigid core member curved longitudinally and laterally to cover both the wrist and back of the hand and having fastening bands and fastening members for securing the wrist support over the upper and lower portions of the back of the hand and over the wrist portion.

3,790,169

APPARATUS FOR SIMULATING CROSSROADS VEHICULAR TRAFFIC

Richard L. Brown, 1812 Pelton Ave., Bellevue, Nebr.

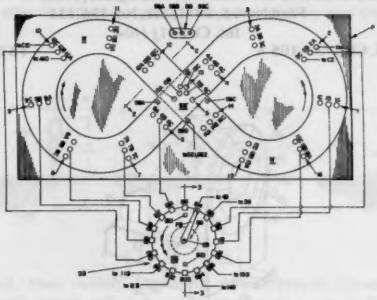
Filed Oct. 2, 1972, Ser. No. 294,381

Int. Cl. A63f *9/14*

U.S. Cl. 273—86 R **11 Claims**

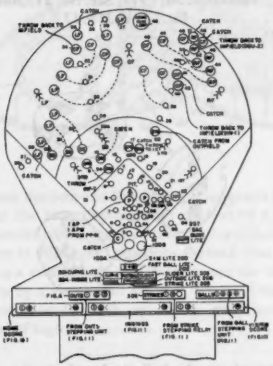
There is provided amusement apparatus having some roadway system layout including at least two cross-wise intersecting roadway segments that together define one or more roadway crossroads portion, there being a plurality of simulated vehicles movably traveling along the roadway and merging towards the crossroads and preferably from cross-wise directions whereby the potential for vehicular collision exists thereat, speed variation means assigned to individual simulated vehicles and manipulatable remotely from the roadway whereby the operator assigned to an individual vehicle can

control its ability to negotiate crossroads traffic, collision-indication means to apprise an operator whenever his assigned



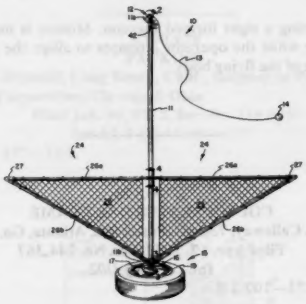
vehicle and another have substantially simultaneously merged at the crossroads, and means for allowing apparent collision victims to survive and thereafter travel along the roadway.

3,790,170
AUTOMATIC ELECTRIC BASEBALL GAME
Delbert S. Alexander, Jr., Evanston, Ill., assignor to Small Business Administration, Washington, D.C.
Division of Ser. No. 48,505, June 22, 1970, Pat. No. 3,655,189, which is a continuation of Ser. No. 683,885, Nov. 17, 1967, abandoned. This application Apr. 3, 1972, Ser. No. 240,671
Int. Cl. A63f *9/00*
U.S. Cl. 273—88 **5 Claims**



A baseball game apparatus includes a defensive control unit with pitch selection switches manually controlled by a player serving as pitcher, and an offensive control unit with pitch anticipation switches on which a player serving as batter selects and swings at or passes an anticipated pitch. A mixer stepping unit randomly selects the resulting play from a category of plays determined by the degree of correspondence between the defensive and offensive pitch switches. The selected play controls sequential energization of a series of lights under a translucent playing field to simulate the movement of a batted ball. A player stepping unit energizes a further series of lights to animate men which converge towards the batted ball flight path. A base running relay energizes lights arranged in a diamond-shaped pattern to animate runners advancing around a base path. Interlocking relays allow one runner to be held on a base while another runner advances. A motor driven play animation unit energizes further series of lights to simulate the ball being returned to the infield. A plurality of stepping relays records the progress of the game, and in response to predetermined positions, such as third out, control energization of the relays and lights to modify the game condition then being displayed.

3,790,171
TETHER BALL APPARATUS INCLUDING ROLLER BEARING AND VERTICAL BARRIER
Leonard R. Anderson, 77 1st Ave., Midvale, Utah
Filed Nov. 22, 1971, Ser. No. 201,027
Int. Cl. A63b *71/02*
U.S. Cl. 273—95 A **4 Claims**

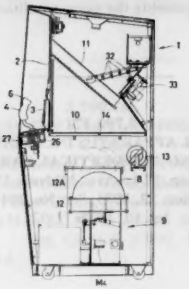


A versatile game apparatus which lends itself to the playing of a number of different skill games between two competing players or for individual game practice. The apparatus consists of an upright pole having a bearing on its top to which a line is attached. A game object, such as a tennis ball, baseball, shuttlecock, football, or the like, is tethered to the other end of the line. The bearing mounting allows the line to rotate freely about the pole such that players opposite to, or alongside, one another can strike the tethered game object back and forth. A simple base mounting arrangement is provided to connect the pole axially to an automobile wheel and tire so as to provide a support for the pole. A collapsible net releasably coupled to the upright pole is provided to form a barrier over which a game of skill associated with the apparatus of the invention is played. The upright pole also has a fixed hole proximate to its top, for attachment of a standard tether ball line thereto.

3,790,172
SIMULATED BOMBING APPARATUS
Masaya Nakamura, Tokyo, Japan, assignor to Kabushiki Kaisha Nakamura Seisakujo, Tokyo, Japan
Filed Oct. 27, 1971, Ser. No. 193,056
Claims priority, application Japan, Sept. 18, 1971, 46-72164; Sept. 18, 1971, 46-72165
Int. Cl. A63f *9/02*
U.S. Cl. 273—101.2 **8 Claims**

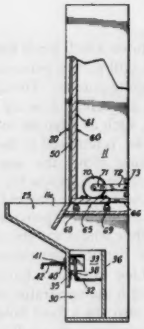
A game of the type in which images of flying bodies are projected on a viewing screen. A player aims at the image of the bodies and fires a simulated projectile thereat. The apparatus

includes a semi-spherically shaped, semi-transparent dome supporting a flying body. A screen is positioned above the



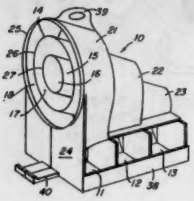
dome having a sight formed thereon. Motion is imparted to the dome while the operator attempts to allign the sight with the image of the flying body.

3,790,173
COIN OPERATED DART GAME
James W. Callaway, 730 Mt. Paron Rd., Atlanta, Ga.
Filed Apr. 17, 1972, Ser. No. 244,367
Int. Cl. F41j *3/02*
U.S. Cl. 273—102.2 R **7 Claims**



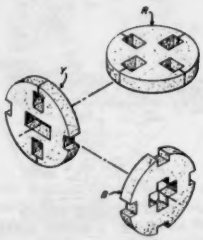
A coin operated dart game wherein darts are propelled into piercing contact with a target assembly having a scoring register for accumulating the results of the areas of the target assembly penetrated by the darts. The target apparatus is located behind a fixed screen member and is supported on a carriage for cyclic movement by an electric motor from a forward dart receiving position to a rearward dart removing position, with the motor being cyclically driven in response to a dart penetrating the target apparatus. A collector is operatively associated with the dart game for collecting the removed darts in a container, with the container being operated from a dart storing position to a dart dispensing position in response to operation of a coin deposit.

3,790,174
CONCENTRIC TARGET ASSEMBLY HAVING SIDE STORAGE COMPARTMENTS
John A. Skillern, 132 State St., Framingham, Mass.
Filed Nov. 5, 1971, Ser. No. 196,134
Int. Cl. F41j *1/04*
U.S. Cl. 273—105 A **13 Claims**



A target capable of capturing and segregating projectiles comprising a series of generally concentric tubular members of different sizes describing target areas and arranged to receive projectiles. The tubular members are arranged so that projectiles entering the target face defined by the tubular members are deflected rearwardly and downwardly into separate storage compartments associated with the respective target areas described by the tubular members. The storage compartments are located along the side of the target.

3,790,175
PUZZLE BALL
Richard W. Ragnow, Excelsior, Minn., assignor to Funforms Inc., Excelsior, Minn.
Filed Dec. 30, 1971, Ser. No. 213,888
Int. Cl. A63f *9/12*
U.S. Cl. 273—160 **2 Claims**

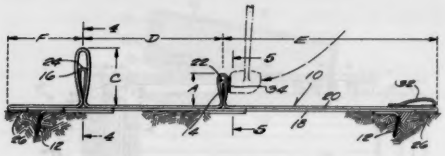


An improved puzzle ball made of elastic, compressible members of uniform thickness, and configured to give peripheral as well as central interlocking.

3,790,176
GOLF SWING GROOVING DEVICE
Adelbert E. Rietz, 1306 N. 63rd Ct., Milwaukee, Wis.
Filed Apr. 9, 1973, Ser. No. 350,217
Int. Cl. A63b *69/36*
U.S. Cl. 273—186 R **5 Claims**

A flat, elongated strip of belting material reinforced by a metal backing is adapted to be anchored to the ground by downwardly-projecting prongs. Two flexible uprights, in the form of integral loops of the belting material, extend upwardly from the strip at longitudinally-spaced locations. A target mark which may be shaped and colored to simulate a golf ball is borne by one of the uprights. The other upright is dimen-

sioned and positioned so that a properly swung golf club which strikes the simultated golf ball will also strike the other upright, thereby making two slapping sounds, while an improperly swung golf club which strikes the simulated golf ball will miss the other upright, thereby making only one slapping



sound, thus audibly indicating the difference between a properly swung golf club and an improperly swung golf club. The elongated strip is dimensioned to comfortably fit within a golf bag containing golf clubs. The prongs on the elongated strip are inclined at an angle toward the direction of club head travel.

3,790,177

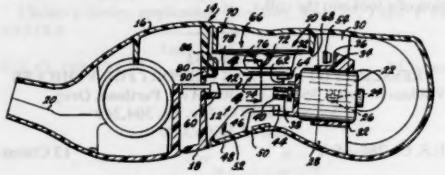
MECHANICAL COUPLING FOR CONNECTING A SOUND PICKUP TO A SOUND AMPLIFIER

George W. Sioles, Palos Verdes Estates, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Mar. 24, 1972, Ser. No. 237,848

Int. Cl. G11b *3/00, 25/04*

U.S. Cl. 274—1 A **4 Claims**



Audio beam has one end fixed in a phonograph housing and extends over the recorded-message portion of a phonograph record in contact with a speaker cone and is slideably engaged by a tone arm in all rotated positions thereof. The fixed end of the beam has a compliance which increases the total stiffness of the system by a very small amount. On the other hand, the overall beam construction is made sufficiently stiff to minimize loss of high frequencies.

3,790,178

BEARING SEAL

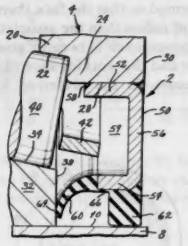
Robert W. Cameron, Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Jan. 17, 1972, Ser. No. 218,440

Int. Cl. F16j *15/32*

U.S. Cl. 277—95 **11 Claims**

A seal for a tapered roller bearing includes a mounting insert having concentric axial walls interconnected by a radial wall. The inner of the two axial walls is pressed onto the thrust rib of the bearing cone until the radial wall is flush with the cone back face. Hence, the insert does not obstruct the back face of the cone and therefore has no effect on the adjustment of the bearing. An elastomeric deflection member is bonded to the free end of the outer axial wall, and this deflection member extends obliquely toward the cup front face, with which it is engaged. A dirt excluder is also bonded to the outer axial wall and projects outwardly therefrom. The outer diameter of the dirt excluder is slightly less than the outer diameter of the bearing cup so that the dirt excluder does not engage



the wall of the housing bore into which the cup is fitted. Thus, friction exists only between the deflection member and cup front face so that seal drag is minimized.

3,790,179

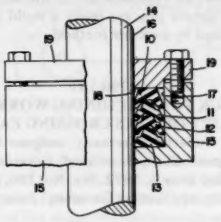
PACKING

John B. Scannell, Long Beach, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jan. 10, 1972, Ser. No. 216,696

Int. Cl. F16j *15/18, 15/32*

U.S. Cl. 277—124 **4 Claims**



An annular generally V shaped sealing ring for use in multi-ring packing assemblies for hydraulic sealing applications, the ring having a flat base and a flat seat on the opposite side of the ring for accommodating the base of a similar, adjacent sealing ring. The ring also having two sealing lips, the inner and outer sides of each lip extending from the radially corresponding inner and outer edges of the base and seat, and the lips being formed such that, when the base of one ring is abutting the seat of another, the lips of the one ring do not contact the lips of the other except at high system fluid pressures.

3,790,180

FLUID SEAL WITH PUMPING ACTION

William O. Heyn, and Glenn W. Peisker, both of Barrington, Ill., assignors to Chicago Rawhide Manufacturing Company, Chicago, Ill.

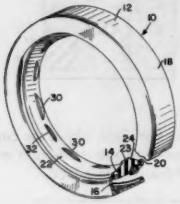
Filed May 28, 1971, Ser. No. 147,949

Int. Cl. F16j *15/54, 9/00*

U.S. Cl. 277—134 **6 Claims**

An oil or like fluid seal acting upon rotation of an associated element to pump oil lying on the associated element into the region being sealed. The described forms of seals include a primary lip and a plurality of individual, wedge-like pumping elements, with the elements having the working surfaces thereof lying substantially parallel to the associated element so as to overlie the element along a substantial portion thereof.

The actual working surface comprises only a portion of the entire surface of the pumping element which is directed toward the associated element, with contact being formed along a large area of generally truncated eliptical pattern. The pumping element is formed so that the face thereof is flat, or of substantially different radius than the associated element, causing gradual radial convergence between a given portion of the associated element and the working face of the element as relative rotation occurs. In the preferred form, several of the



pumping elements are radially spaced relative to one another and thereby adapted for successive operative engagement with the shaft or other element only after at least portions of the other elements have been worn in use. Accordingly, a succession of elements is inherently brought into working engagement with the movable element to provide continued pumping action throughout an extended life of the seal unit. The seals are made by a simple process using a mold core which is in turn manufactured by a simple method.

3,790,181

SWIVEL CHUCK FOR MACHINING WORKPIECES WITH A PLURALITY OF AXES CROSSING EACH OTHER

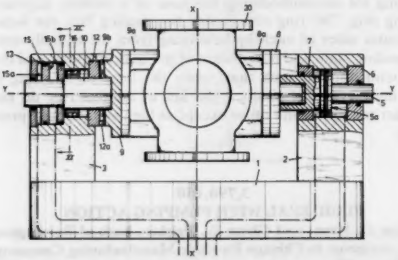
Hans Scharfen, Buderich, Germany, assignor to Paul Forkardt Kommanditgesellschaft, Dusseldorf, Germany

Filed June 6, 1972, Ser. No. 260,108

Claims priority, application Germany, June 9, 1971, P 21 28 618.0

Int. Cl. B23b *31/30, 31/34*

U.S. Cl. 279—4 **12 Claims**



A chucking device in which a chuck body has aligned opposed jaws reciprocable toward and away from each other on a common axis and rotatable on the axis. Respective actuators are provided for the jaws to effect the reciprocation of the jaws on the axis. One jaw locks to the chuck body in an outermost position while the actuator therefor develops a greater thrust than the actuator for the other jaw.

3,790,182

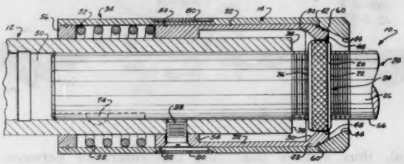
TOOLHOLDER

Ralph Henry Schuman, Euclid, Ohio, assignor to The Warner & Swasey Company, Cuyahoga, Ohio

Filed June 5, 1972, Ser. No. 259,736

Int. Cl. B23b *31/20*

U.S. Cl. 279—43 **12 Claims**



An improved toolholder includes a collet which engages a presetting or adjusting nut on the shank of a tool to retain the tool against movement relative to a spindle. The collet has jaws with gripping surfaces which are disposed in abutting planar engagement with a conical chamfer surface on an axially outer face of the presetting nut when the collet is in a closed condition. The collet is operated between the open and closed conditions by a sleeve having camming surfaces which are pressed against outer surfaces of the collet jaws under the influence of a biasing spring when the collet is in the closed condition. In one specific embodiment of the invention, an ejector is provided to move the tool outwardly as the collet is opened. The collet may be retained in the open condition by a locking assembly which is automatically released upon insertion of a tool into the collet.

3,790,183

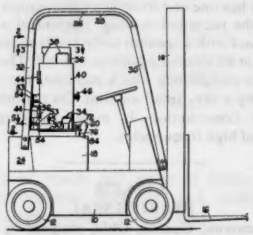
PRESSURIZED FUEL TANK SUPPORT FOR VEHICLES

William R. Price, 3607 S.E. 130th Ave., Portland, Oreg.

Filed Nov. 6, 1972, Ser. No. 304,249

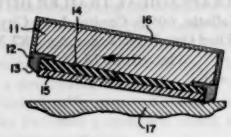
Int. Cl. B60p *3/00*

U.S. Cl. 280—5 A **13 Claims**



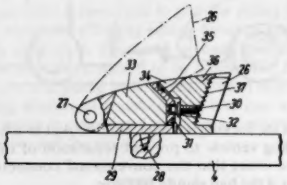
A pressurized fuel tank for a vehicle engine is confined removably in a protective case formed of a pair of hinged half shells to one of which a tank supporting base is secured. A hinge assembly, secured to one of the half shells, is adapted for attachment to a frame member of a vehicle, such as a lift truck, for supporting the case for pivotal adjustment between a retracted position within the perimeter of the vehicle, for protection of the fuel tank during operation of the vehicle, and an extended position projecting outwardly of the perimeter of the vehicle, for enabling opening of the case and replacement of the fuel tank.

3,790,184
SKI CONSTRUCTION
James F. Bandrowski, 382 Berkshire Rd., Ridgewood, N.J.
Filed Dec. 13, 1972, Ser. No. 314,906
Int. Cl. A63c 5/04
U.S. Cl. 280—11.13 J 8 Claims



An improved snow ski comprising a rigid core, downwardly extending running edges affixed to the core, a block of resilient material disposed between the running edges and affixed to the core, and a planar bottom member, slidably disposed between the running edges and affixed to the resilient block of material. During turning, the weight of the skier and centrifugal forces acting upon the ski compress the resilient block of material so that the bottom of the ski slides inwardly past the running edge of the ski disposed on the inside of the turn and the running edge protrudes past the bottom of the ski and engages the snow or ice on which the ski is moving.

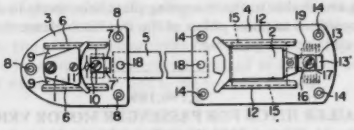
3,790,185
SKI SAFETY BINDING
Reinhold Sommer, Essen, Germany, assignor to Hans Muller, Kettwig, Germany, a part interest
Division of Ser. No. 67,080, Aug. 26, 1970, Pat. No. 3,687,471.
This application May 1, 1972, Ser. No. 249,251
Claims priority, application Germany, Aug. 27, 1969, P 19 43 518.8
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 5 Claims



A ski safety binding for connection to a ski board with heel holding means for clamping the heel of a ski boot, in which magnetic means supported by base plate means cooperate with a soft iron plate which has connected thereto heel grasping means comprising tongue means for supporting a ski boot from below and also comprising a clamping member for grasping a ski boot heel from behind and holding the same in position.

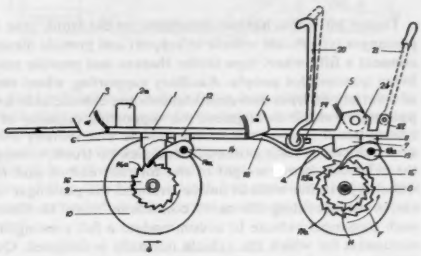
3,790,186
CLAMPING IRON FOR SKI BOOTS
Hiroaki Kanno, No. 4-17, 3-chome, Machiya, Arakawa-ku, Tokyo, Japan
Filed Mar. 28, 1972, Ser. No. 238,883
Claims priority, application Japan, Sept. 6, 1971, 46/68664; Dec. 29, 1971, 46/2925
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 C 11 Claims

Clamping irons for ski boots, comprising a pair of toe-iron and heel-iron connected by means of a metalic band plate fixedly or detachably and adjustably, or by means of a coiled spring detachably and adjustably. Both of such connecting



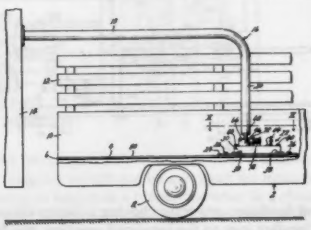
means can be bent vertically but cannot be bent horizontally, thus the ski boots can be easily and exactly clamped to the ski plate, removing any trouble at the time of ski running.

3,790,187
WALKING SYSTEM FOR PARAPLEGICS
Gheorghe Radu, Aleina Negreni 4, and Alexandru Aldea, Str. Justinian nr. 18, Sector 2, both of Bucharest, Romania
Filed Dec. 1, 1971, Ser. No. 203,528
Int. Cl. A63c 17/14
U.S. Cl. 280—11.2 4 Claims



A walking system for paraplegic and like patients incapable of use of the leg and foot muscles comprises a skate having a front and a rear pair of rollers with parallel axes inclined to the longitudinal axis of the skate and horizontally offset in the longitudinal direction. Pawl-and-ratchet arrangements prevent reverse rolling of the wheels of both pairs while a lever-operated pawl is designed to prevent rolling of at least one of the pairs of wheels in the forward direction upon deflection of a lever in response to the position of the patient's leg.

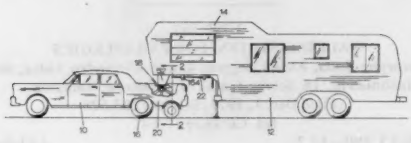
3,790,188
GOOSENECK TRAILER HITCH FIXTURE FOR PICK-UP TRUCKS
John H. Johannes, Rt. 1, Robinson, Kans.
Filed Mar. 27, 1972, Ser. No. 238,418
Int. Cl. B60d 1/00
U.S. Cl. 280—423 2 Claims



A gooseneck trailer hitch fixture for pick-up trucks consisting of a mounting plate adapted to be secured to the floor of a

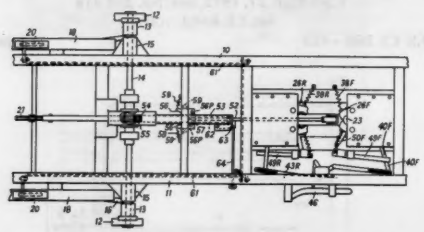
pick-up truck bed, a carrier releasably affixed to the mounting plate, and a hitch ball and a hitch socket secured to the carrier in horizontally spaced apart relation for selective use with trailers equipped with either type of hitch element, the carrier being attachable to the mounting plate selectively in either of two positions to place either of the two hitch elements carried thereon in position for use.

3,790,189
TRAILER HITCH FOR PASSENGER MOTOR VEHICLE
Charles M. Winter, 2580 W. Philadelphia St., York, Pa.
Filed Aug. 25, 1972, Ser. No. 283,822
Int. Cl. B62d *53/00*
U.S. Cl. 280—423 R **13 Claims**



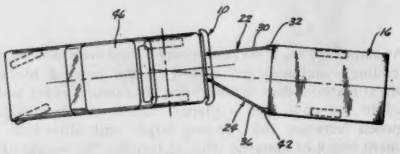
Trailer hitch mechanism attachable to the trunk area of a passenger type motor vehicle to support and provide means to connect a fifth-wheel type trailer thereto and provide mobile living quarters for people. Auxiliary supporting wheel means of a variety of types and embodiments are connectable to the passenger vehicle to augment the supporting capacity of the conventional rear wheels of the vehicle and thereby enable such vehicle, as distinguished from a pick-up truck, to support the relatively heavy weight of the forward end of said fifth-wheel type trailer without undue strain on the passenger vehicle, while providing the more comodious travel facilities of such passenger vehicle to accommodate a full contingent of occupants for which the vehicle normally is designed. Quick detachment of the trailer and auxiliary supporting wheel means from the vehicle readily restores the vehicle to the normal appearance of the vehicle with a minimum of effort.

3,790,190
KING-PIN ACTUATED LANDING GEAR FOR ROAD-HAULAGE SEMI-TRAILERS
Carlton John Davis, 101, Chesterfield Rd., Leyton, London, England
Filed Apr. 13, 1972, Ser. No. 243,812
Claims priority, application Great Britain, Apr. 15, 1971, 9,535/71
Int. Cl. B62d *53/12*
U.S. Cl. 280—430 **9 Claims**



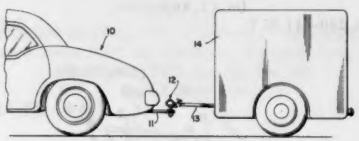
A road-haulage semi-trailer having a sliding king-pin for lifting the landing legs to the retracted position, the landing legs being spring-biassed towards the retracted position and coupled to the king-pin through a rack and pinion to give rapid lifting of the legs with a small king-pin movement. The king-pin is disengageable to move independently of the landing legs over a large distance between front and rear clamps which enable it to be locked in either a front or a rear position for travelling.

3,790,191
TRAPEZOIDAL TRAILER HITCH
Norman W. Gallatin, 609 S. Capitol, Iowa City, Iowa
Filed Oct. 7, 1971, Ser. No. 187,350
Int. Cl. B62d *53/00*
U.S. Cl. 280—456 **5 Claims**



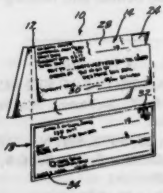
A trapezoidal trailer hitch comprising first and second, spaced apart hitch members pivotally connected at their rearward ends to the forward end of the trailer and pivotally connected at their forward ends to the rearward end of a truck or the like.

3,790,192
TRAILER HITCH SAFETY DEVICE
Edgar E. Green, Rt. 2, Box 55A, Shelbyville, Tex.
Filed July 14, 1972, Ser. No. 271,890
Int. Cl. B60d *1/06*
U.S. Cl. 280—507 **5 Claims**



Apparatus for locking a trailer hitch socket to a ball carried by a propelling vehicle to prevent separation of the ball and socket in the event that the conventional connecting means should fail or if the ball should fracture.

3,790,193
COMBINATION STATEMENT AND CHECK AND METHOD OF MAKING A NEGOTIABLE CHECK
Robert L. McBride, 1300 Woodhollow, Houston, Tex.
Filed Oct. 26, 1971, Ser. No. 192,230
Int. Cl. B42d *15/00*
U.S. Cl. 283—57 **3 Claims**



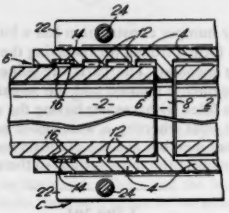
A statement includes an overlay check detachably connected thereto along a fold line. The check overlay is folded

into overlapping relationship on the statement and an end guide flap extends upwardly adjacent the end of the check overlay. A complete check form is placed between the check overlay and the statement against the end flap and fold line. The overlay is pressed into engagement with the check form to permanently bond the two adhesively together. The check overlay includes in machine readable indicia amount, date, payer and payee information and the complete check form has payer account identification and check form number exposed. The assembled check is separated from the statement by the check overlay being torn along the fold line. The check overlay may include a detachable marginal portion which includes the payer's account identification and check number such that the check overlay becomes a complete check in and of itself and needs no separate check form.

3,790,194
PIPE COUPLING

Stanley H. Kimberley, Shelburne, Ontario, Canada, assignor to Kelstan Plastic Products Limited, Weston, Ontario, Canada

Filed Aug. 2, 1972, Ser. No. 277,413
Int. Cl. F16l *21/06*
U.S. Cl. 285—373 **4 Claims**

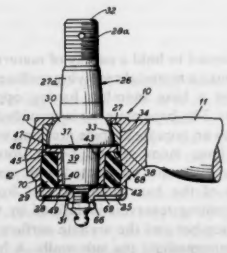


A coupling for rigid piping formed of incisable pipe materials including a rigid sleeve having open ends respectively providing mating for a pair of ends of piping to be coupled in flow-through relation; a clamp for releasably clamping said sleeve to constrict it about and to grip the piping ends mating therewith; means for effecting sealing between said sleeve and said piping ends when the sleeve is constricted as aforesaid, and anchor elements disposed to be sandwiched between the mating sleeve and piping ends; at least one of said anchor elements being sharpened enabling it to bite into a piping end when the sleeve is constricted as aforesaid whereby to interlock the sleeve and the piping.

3,790,195
SOCKET JOINT

Edward J. Herbenar, Detroit, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed June 27, 1972, Ser. No. 266,550
Int. Cl. F16c *11/06*
U.S. Cl. 403—124 **4 Claims**

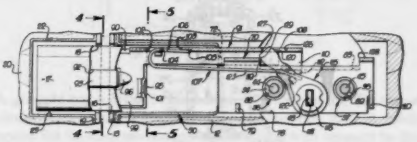


A ball seat socket joint primarily for rotational movement with a stud projecting from an internal cavity housing, the stud having a half sphere bulged section received in the housing seated against a spherical face seat adjacent the projecting point of the stud from the housing. The stud has an axial extension beyond the half sphere within the housing; the axial extension is received in a bearing with a resilient member entrapped between the wall of the cavity and the bushing. The opposite end of the housing cavity from the point of projection is closed by a cap which applies a preload to the axial end of the stud within the cavity and to the resilient member.

3,790,196
DEAD BOLT LATCH

Vernard W. Sanders, Los Angeles, Calif., and William J. Fane, North Vancouver, B.C., Canada, assignors to Norris Industries, Inc., Los Angeles, Calif.

Filed Feb. 7, 1972, Ser. No. 224,056
Int. Cl. E05c *1/06*
U.S. Cl. 292—140 **10 Claims**

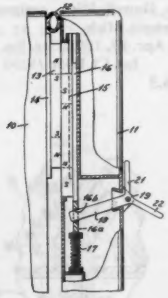


A dead bolt latch for a door has a cam action for extending the bolt, the cam having the form of a pivoted arm and rotated by the tail piece of lock device. The pivot axis is near one edge of a lock case extension and engages a cam opening in an actuating slide at the opposite side of the case extension. The actuating slide is attached to a latch bolt and shifts the latch bolt between extended and retracted positions when the cam is rotated.

3,790,197
MAGNETIC LATCH

Rollin James Parker, Greenville, Mich., assignor to General Electric Company

Filed June 22, 1972, Ser. No. 265,294
Int. Cl. E05c *19/16*
U.S. Cl. 292—251.5 **5 Claims**



A magnetic latch has a pair of substantially coextensive permanent bar magnets which can be arranged for mutual attraction positioning to maintain a hinged member in a closed position. One of the magnets is made axially movable with respect to the other so as to assume a mutual repulsion position with the other which will enable the magnets to assist in opening the hinged member. The movable magnet is actuated by a manually operable member such as a lever bar mounted on a

pivot on which manually actuated bars are also mounted to enable the movable magnet to be positioned by manual operation of the actuating bars. A biasing spring to reduce the force necessary to be applied to move the magnet is also provided.

3,790,198

SELF-LOCKING SAFETY SEAL AND METHOD OF IDENTIFYING TAMPERING THEREWITH

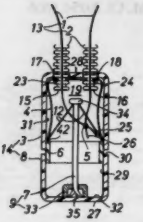
Armin Theodor Hagen, Karlsruhe, Germany, assignor to Gesellschaft fur Kernforshung mbH, Karlsruhe, Germany

Filed June 2, 1971, Ser. No. 149,140

Claims priority, application Germany, June 11, 1970, P 20 28 672.0

Int. Cl. B65d *33/34*

U.S. Cl. 292—317 **7 Claims**



A self-locking safety seal composed of a body, a holding device, a holder and a loop. The body includes two main parts made of light transmitting material with one of the main parts supporting the holding device and the other main part supporting the holder.

The holder engages and locks with the holding device in the assembled condition of the body. The loop includes a corrugated tube which has two ends secured in the holding device.

The method of detecting tampering with a self-locking safety seal including placing identification marks on inner parts of the body, photographically recording by means of an original photograph, the identification marks, photographically recording the identification marks during inspection of the seal and comparing the photographs.

3,790,199

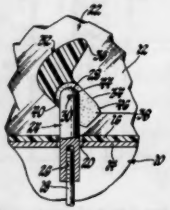
GARNISH BUTTON ASSEMBLY

Richard P. Ballou, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 17, 1972, Ser. No. 244,681

Int. Cl. E05c *19/00*

U.S. Cl. 292—336.3 **3 Claims**



A garnish button assembly for installation as a shift rod associated with the latch system on an automobile vehicle type door and adapted to thwart attempts to manipulate the latch system by a hook-like tool from without the vehicle, the button assembly including a body portion rigidly attached to the shift rod and an enlarged head pivotally supported on the body portion above the door garnish panel. Attempted manipulation of the garnish button assembly by a hook-like tool applies a force asymmetrically to the head thereby to initiate free pivotal movement of the latter for preventing the tool from gaining a firm hold on the button assembly.

3,790,200

VEHICLE BUMPER

Carl L. Kalitta, Adrian, Mich., assignor to Dura Corporation, Southfield, Mich.

Filed Mar. 24, 1972, Ser. No. 237,711

Int. Cl. B60r *3/00, 19/04;* **B61f** *19/04*

U.S. Cl. 293—98 **4 Claims**

A vehicular bumper construction has a bumper bar having a lip offset to form a trough for receiving the mating portions of a platform member. The parts are joined by welds, the complete assembly is painted and the remaining portions of the trough are filled with a sealer having the same color as the finished paint coat whereby a waperproof sealer is provided between the bar member and the platform member to prevent bleeding of rust onto the show surface of the construction.

3,790,201

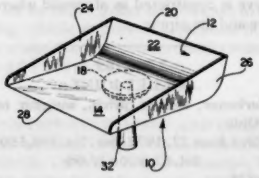
HAWK

Frank Peter Morsilli, James St., Orchard Acres, Greenville, R.I.

Filed Jan. 12, 1973, Ser. No. 325,944

Int. Cl. E04g *21/16*

U.S. Cl. 294—3.5 **6 Claims**



A hawk adapted to hold a supply of material such as mortar for delivery onto a material receiving surface is disclosed. The hawk includes a base member having opposed upper and lower surfaces. The base member is provided with a front wall which includes an arcuate surface merging with the upper surface of the base member and being upturned therefrom. Separate side walls are connected with respective first and second sides of the base member and front wall. Thus, a material containing reservoir is defined by the upper surface of the base member and the arcuate surface of the front wall, in the zone intermediate the side walls. A handle is provided on the bottom surface of the base member for holding the hawk.

3,790,202

PECAN RETRIEVER

C. Rudolph Nagel, 1305 Ainsworth, Gonzales, Tex.

Continuation-in-part of Ser. No. 860,926, Sept. 25, 1969, Pat. No. 3,600,029. This application Nov. 12, 1970, Ser. No. 88,637. The portion of the term of this patent subsequent to Aug. 17, 1988, has been disclaimed.

Int. Cl. A01d *1/02*

U.S. Cl. 294—19 A 4 Claims

This specification discloses a device intended to be used in retrieving pecans from the ground with a pick up action. The device comprises an elongate rod having an open bottom receptacle secured to its lower end. This receptacle has parallel side walls. A spring of general U shape includes side legs and a straight back. The upper ends of the legs are anchored to the side walls on their outer faces and the back spans the open bottom between the lower edges of the sides. A roller is rotatably mounted on the back and is adapted to engage a pecan with a rolling action as the open end of the receptacle is forced thereover.

3,790,203

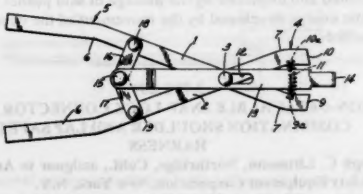
PARTS HANDLING MEANS

Ernest J. Urbas, Richmond Heights, Ohio, assignor to Guarantee Specialty Manufacturing Company, Cleveland, Ohio

Filed Sept. 5, 1972, Ser. No. 286,555

Int. Cl. A47j *45/00*

U.S. Cl. 294—31 R 1 Claim



The disclosure hereof is of parts handling means comprising a scissor-like unit having a handle portion and a part engaging section with a reciprocating member operable by connections with the handle portion, and including a part engaging element which, upon manipulation will move the part engaging element toward the part engaging section whereby parts may be gripped therebetween and manipulated thereafter in the gripped condition, obviating the necessity for an operator of a dangerous machine or the like to place his hand in the line of movement of anything which would possibly injure the hand, whereas the handling means of this invention will manipulate the part readily.

3,790,204

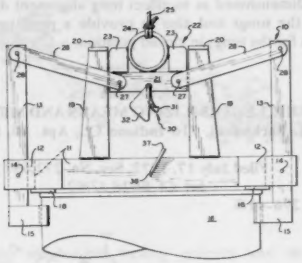
GRAPPLE WITH SEMI-AUTOMATIC LATCH

Charles H. Lighthipe, Jr., Liverpool, and Robert R. Andrews, Syracuse, both of N.Y., assignors to Morse Manufacturing Co., Inc., Syracuse, N.Y.

Filed Jan. 11, 1973, Ser. No. 322,614

Int. Cl. B66c *1/42*

U.S. Cl. 294—110 R 3 Claims



A grapple has a cross beam adapted to rest on the flat top of a drum extending diametrically thereacross and a slide adapted for limited movement up or down with respect to the beam and secured to hoist means. The beam has a lever pivotally secured thereto at each end, the upper end of each lever being pivotally connected to one end of a link and the lever lower ends being provided with grip means for engaging the side of the drum. The other ends of the links are pivotally secured to the slide so that when the slide is raised the grip means move toward and grip the drum sides. A hook and a triangular weight are rotatably mounted on a bolt projecting from the beam at its center, the pin passing through a hole in the top of the hook and a hole in one corner of the weight. The hook has a pin projecting therefrom for engaging the weight on one side or the other as the weight is swung arcuately around the bolt. A bar secured to the beam has a lower end engageable by the hook. When the weight is on one side of the hook pin it biases the hook to automatically release the load when the load is next lowered. When the weight is on the other side it biases the hook for automatic pick-up of a load.

3,790,205

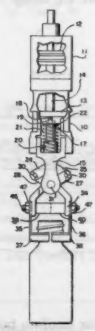
TAKEOUT TONG ASSEMBLY

William Wenz, 427 Carton Ave., Millville, N.J.

Filed Sept. 25, 1972, Ser. No. 291,735

Int. Cl. B66c *1/28*

U.S. Cl. 294—115 1 Claim



Improvements to conventional apparatus commonly known as takeout tong holders for removing bottles and the like from

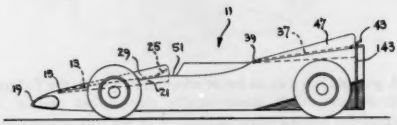
glass molding machines. Conventional takeout tong holders include first and second opposed tong holders and tongs which are pivotly disposed on a common horizontal axis and actuated through arcuate paths between open and closed positions. The improvement includes alignment and stop blocks either formed integrally with or bolted to each of the tong holders midway of their length. The alignment and stop blocks project inwardly toward one another from the tong holders and are of a complementary configuration, one to another, and so dimensioned as to effect tong alignment during actuation of the tongs and also to provide a predetermined stop position for the tongs in closed position.

3,790,206

VEHICLE STABILIZING MEANS AND METHOD

Henry J. Backowski, 716 Indiana Ct., Apt. 40, El Segundo, Calif.

Filed July 17, 1972, Ser. No. 272,691
Int. Cl. B62d *37/02*
U.S. Cl. 296—1 S **17 Claims**



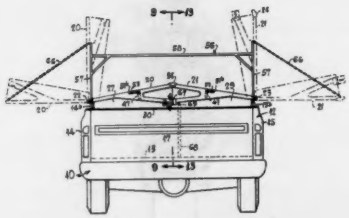
A device for stabilizing vehicles, particularly racing cars, and a method of stabilization utilizing same which comprises a flat movable pressure plate which is hinged at adjacent the front of a vehicle and can be controllably moved upward or downward in accordance with the air pressure exerted thereon. A pivotal pressure plate is connected to the rear of the flat pressure plate and can move in accordance wherewith to maintain air pressure on the flat pressure plate. Movable side fences are additionally provided to confine air onto the top surface of the flat pressure plate and act as four rudder stabilizers at all times. A similar flat movable pressure plate arrangement with a second pivotal pressure plate and side fences is provided at the rear of the car behind the driver and the top rear surface of the vehicle. Air deflectors, particularly at the rear of the car, are also provided.

3,790,207

COMBINATION ROOF AND SIDEWALL EXTENSIONS FOR VEHICULAR HAULING BEDS

Dennis Anderson, Box 252, Rt. 1, Barnum, Minn.

Filed Mar. 15, 1972, Ser. No. 234,700
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 G **4 Claims**



A collapsible vehicular hauling bed construction wherein a pair of panels are respectively hinged along parallel axes to two opposed sidewalls of a rectangular truck bed and swingable inwardly to inclined abutting positions to form an inverted U-shaped roof, and swingable outwardly to upright positions to form extensions of the opposed sidewalls, in combination with a third panel hinged along a third axis normal to at least one of the two first-named axes, said third panel adapted to rotate between a collapsed position beneath the abutting roof panels and an upright position forming an extension of one of the remaining bed sidewalls, and means for releasably connecting the upright third panel between said upright pair of panels to thereby form a continuous wall extension for three sidewalls of the hauling bed.

3,790,208

SAFETY BELT

Noboru Komatsu; Choji Nozaki; Toshio Kurauchi, and Toshihiko Sakai, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Continuation-in-part of Ser. No. 97,989, Dec. 14, 1970, abandoned. This application June 7, 1972, Ser. No. 260,615
Int. Cl. A62b *35/60*
U.S. Cl. 297—386 **17 Claims**

A safety belt for tightly holding an occupant of a seat for vehicles such as an automobile, said safety belt being equipped with a shock absorbing means having a rigid plastics foam body, a receptacle with a uniform cross-section and a bottom plate, and a pusher having a tapering face the projected area of which is less than 70 percent of the cross-sectional area of said plastics foam body, said foam body being held in said receptacle between the pusher and the bottom plate, said pusher being movable toward said bottom plate when a tension is generated by the movement of an occupant supported by the belt so that said plastics foam body is deformed and displaced by the passage of said pusher and the kinetic energy developed by the movement of the occupant is absorbed.

3,790,209

NON-DETACHABLE SNAP-LOCK CONNECTOR FOR COMBINATION SHOULDER AND LAP SAFETY HARNESS

Joseph C. Littmann, Northridge, Calif., assignor to American Safety Equipment Corporation, New York, N.Y.

Filed Sept. 14, 1972, Ser. No. 289,079
Int. Cl. A62b *35/60*
U.S. Cl. 297—389 **9 Claims**

A non-detachable snap-lock connector is provided to facilitate installation of a combination shoulder harness and lap harness vehicle restraint system, in which the shoulder and lap harness assemblies may be manufactured, shipped and mounted in a vehicle as separate unconnected components and as a final assembly step the shoulder harness is irreversibly permanently snap-locked to the lap unit by means of the provided connector. In this safety restraint system, the shoulder harness must be worn along with the lap restraint, thus necessitating a permanent non-detachable connection of an end of the shoulder harness to the lap buckle or tongue plate such

that the user does not have the option of disconnecting the shoulder strap and using only the lap harness. By means of the disclosed non-detachable snap-lock connector, installation is completed by a quick coupling engagement of fitting means forming the connector and carried by the portions of the shoulder and lap harnesses to be permanently joined. The connector itself is provided by a first fitting affixed to one of the harnesses, such as the shoulder strap, and a second fitting carried by a tongue plate of a buckle tongue plate combination in the lap restraint unit, and a unidirectional spring lock means disposed therebetween and functioning to irreversibly lock the fittings together upon movement thereof into coupling engagement.

3,790,210

LONGWALL MINING INSTALLATION WITH DRIVE CHAIN TENSION CONTROL

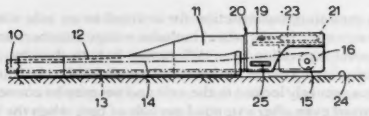
Werner Georg, Altlunen, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Wethmar bei Lunen, Westfalia, Germany

Filed July 3, 1972, Ser. No. 268,912

Claims priority, application Germany, July 14, 1971, P 21 35 164.4

Int. Cl. E21c *29/16*

U.S. Cl. 299—43 **16 Claims**



A mineral mining installation with a longwall scraper-chain conveyor having a chain at one side for driving a mineral winning machine. The conveyor is detachably affixed at one end to a frame of a drive station for the chain. The drive station has a frame attached to the conveyor which frame has a top wall which is provided on its underside with two guide tubes. These guide tubes slidably support a constructional unit composed of a drive motor and gearing. The gearing has an output shaft which carries a sprocket wheel engaged with the chain and disposed close to the floor of the working. The upper and lower runs of the chain are guided onto the sprocket wheel with little or no angular deviation from their normal rectilinear course parallel to the conveyor. A piston and cylinder device is used for displacing the unit along the guide tubes to vary the tension in the chain.

3,790,211

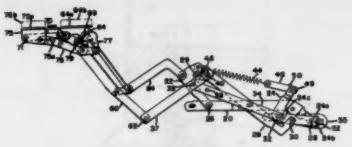
FOOTREST MECHANISM

Robert J. Caldwell, 496 Kennedy Blvd., Bayonne, N.J.

Filed June 11, 1971, Ser. No. 152,256

Int. Cl. A47c *1/02*

U.S. Cl. 297—75 **3 Claims**



A footrest mechanism having primary and secondary footrest members. The primary footrest and secondary footrest have a nested position and an extended position and are so constructed and operated that the secondary footrest member slides out under the primary footrest when being moved to its extended position. The mechanism also has an overload safety feature to prevent deformation of its structural members in the event of excessive force being applied to the footrest when in its extended position.

3,790,212

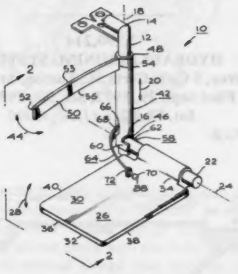
FOOT SUPPORT FOR WHEELCHAIRS

Shigemitsu Suyetani, 22461 Gravino, Lawndale, Calif.

Filed Mar. 27, 1972, Ser. No. 238,401

Int. Cl. A47c *7/50*

U.S. Cl. 297—429 **10 Claims**

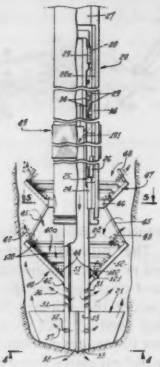


A leg rest arrangement for wheelchairs of the type in which a foot rest is pivotally mounted on a supporting member and movable from a foot rest position to a closed position. There is provided a leg support spaced vertically from the foot rest for supporting the back of the leg of the user when the foot is resting on the foot rest. The leg support is operatively connected with the foot rest so that when the foot rest is pivoted to the closed position the leg support is also pivoted to the closed position and is compactly and closely adjacent to the foot rest in the closed position.

ERRATUM

For Class 299—43 see:
Patent No. 3,790,210

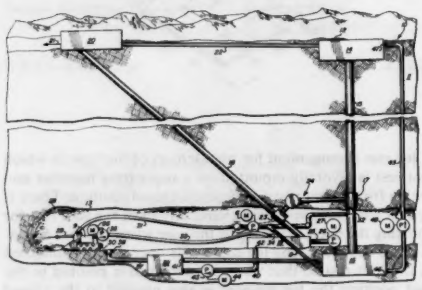
3,790,213
SUB-SURFACE PARTICLE RECOVERY
Donovan B. Grable, Long Beach, Calif., assignor to Wasteland Reclamation Corporation, Long Beach; Bill C. Laney, Torrance and William W. Haefliger, San Marino, all of, Calif., part interest to each
Filed Mar. 5, 1973, Ser. No. 338,151
Int. Cl. E02d *1/00*; E21c *41/14*
U.S. Cl. 299—8 28 Claims



Metal particles, as for example gold, are recovered from sub-surface locations without requiring removal of the overburden. In particular, recovery of gold particles from cracks in underground or underwater bedrock is enabled.

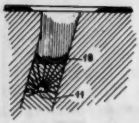
A process and apparatus is disclosed in which a hose is provided to lower a collector means to a sub-surface locality and deliver a stream of water. Means are also provided to rotate the collector to separate valuable material and recover same and cutter is included to cut into the formation at the locality.

3,790,214
HYDRAULIC MINING SYSTEM
Oliver B. Kilroy, 5 Calle Corta St., Tucson, Ariz.
Filed Sept. 29, 1972, Ser. No. 293,401
Int. Cl. E21c *41/00*, *45/00*
U.S. Cl. 299—8 18 Claims



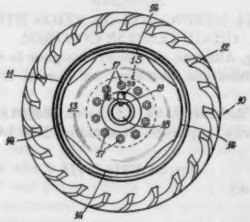
This specification discloses an hydraulic mining system including a method and apparatus whereby energy derived from a downflowing column of water utilized to conduct underground mining operations is mechanically transferred to a pump which drives a column of slurry containing mined ore upwardly to a separator on the ground surface.

3,790,215
RECOVERY OF ORES AND MINERALS WHILE USING ICE AS MEANS OF SUPPORT IN MINED ROOMS
Henning Fangel, Langoddveien 89, Snaroya, Norway
Filed May 3, 1972, Ser. No. 250,052
Claims priority, application Norway, June 11, 1971, 2209/71; Sweden, Dec. 17, 1971, 16199/71
Int. Cl. E21c *41/00*
U.S. Cl. 299—11 9 Claims



For supporting lateral or hanging rock walls in mines it is proposed to make ice flow into the mine rooms freshly worked, according as the mining proceeds to constantly lower levels, so as to protect miners without having to leave pillars requiring second mining.

3,790,216
WEDGE LOCKING WHEEL MOUNTING
Walter R. Peterson, Plainfield, Ill., assignor to Peterson Manufacturing Company, Plainfield, Ill.
Filed Nov. 21, 1972, Ser. No. 308,504
Int. Cl. B60b *37/04*, *27/06*; F16d *1/08*
U.S. Cl. 301—1 9 Claims

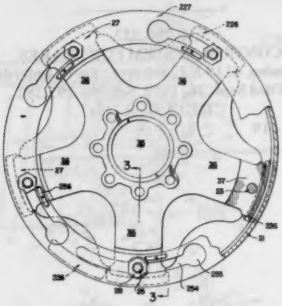


A mounting construction for a wheel to an axle wherein a hub assembly on the wheel includes wedge members arranged for axial separation by a differential bolt to thereby effect a radial gripping of the wedge members with the axle. The wheel is thus securely locked to the axle and yet may be conveniently removed even after extended periods of time when the wedges are in locked position.

3,790,217
CLAMP LUGS AND CARRIER RING FOR A RIM AND WHEEL ASSEMBLY
Robert A. DeRegnaucourt, Centerville, Ohio, assignor to The Dayton Steel Foundry Company, Dayton, Ohio
Continuation-in-part of Ser. No. 252,411, May 11, 1972. This application June 29, 1972, Ser. No. 267,435
Int. Cl. B60b *23/00*
U.S. Cl. 301—12 R 2 Claims

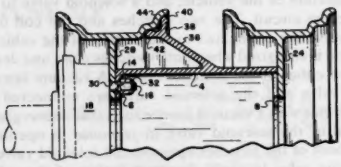
A rim and wheel assembly including a series of axially inner clamp means and a series of axially outer clamp lugs on an annular, full-circle, carrier ring to cooperatively engage the mounting flange of a rim. The wheel has means thereon for positive retention of the clamp lugs. The clamp means are supported by fastening elements extending axially through the wheel. The fastening elements carry fastening means which

draw the clamp means toward the clamp lugs to seat the rim flange. The carrier ring has means thereon so that the clamp lugs may be rotated onto the positive retention means without removal of the fastening means from the fastening elements.



The carrier ring may also have stop means thereon so that the clamp lugs will not be rotated off the positive retention means should the fastening means become loose or untightened during operation.

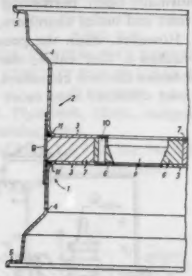
3,790,218
DUAL WHEEL MOUNTING DEVICE
Reed L. Johns, 6733 South 2345 East, Holladay, Utah
Filed Apr. 6, 1972, Ser. No. 241,616
Int. Cl. B60b *11/00*
U.S. Cl. 301—36 R **4 Claims**



A device for mounting dual wheels, said device comprising a generally cylindrical member with radially projecting flanged portions at each end thereof, a plurality of apertures extending through the flanged portion at one end of said cylindrical member and positioned to receive the wheel mounting studs of a vehicle hub, and a plurality of externally threaded shafts projecting outwardly from the flanged portion at the opposite end of said cylindrical member extending parallel to the axis of said cylindrical member and positioned to mate with the mounting apertures of a vehicle wheel. Several forms of the invention are disclosed.

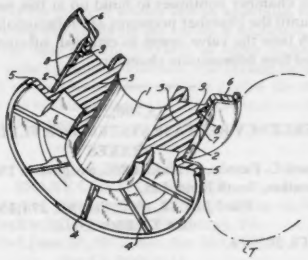
3,790,219
WHEEL
Gerald Alfred Watts, Moreton Morrell, England, assignor to Magnesium Elektron Limited, Swinton, Manchester, England
Filed Feb. 16, 1972, Ser. No. 226,765
Claims priority, application Great Britain, Feb. 17, 1971, 4,826/71
Int. Cl. B60b *3/08*
U.S. Cl. 301—63 DD **15 Claims**

The present invention relates to a vehicle wheel and more particularly to a light-weight wheel for high performance cars such as racing and sports cars. The wheel is constructed from wrought metal, which is better able to withstand stresses than



the same metal which have been cast, by securing together, base to base, two generally dish-shaped members with a light-weight spacer means located between the bases.

3,790,220
WHEEL FOR VEHICLE TIRES
August Manss, Ochshauser Strasse 11-25, Kassel-B, Germany
Filed May 7, 1970, Ser. No. 35,426
Claims priority, application Germany, May 13, 1969, 1924485
Int. Cl. B60b *5/02*
U.S. Cl. 301—63 D **1 Claim**

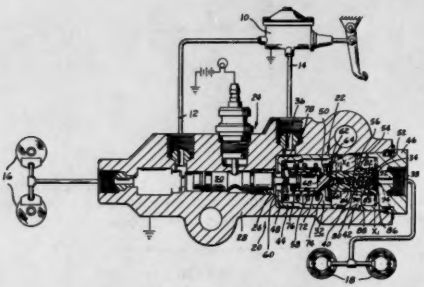


A wheel for vehicle tires comprising a hub of synthetic plastic material having opposite axial ends. In the region of one of these axial ends, a first flange of synthetic plastic material and being of one piece with the hub, projects radially from the latter. A second flange also consists of synthetic plastic material and projects radially from the hub in the region of the other axial end. The second flange is in form of a circumferentially almost complete ring the inner surface of which is provided with a circumferentially extending radially inwardly projecting rib. The ring is to be sprung onto the hub and the rib then becomes lodged in a circumferentially extending groove provided in the outer circumferential surface of the hub. The ring can thus be removed when desired.

3,790,221
BRAKE PROPORTIONING VALVE WITH BLEND BACK
Keith H. Fulmer, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.
Filed Aug. 24, 1972, Ser. No. 272,265
Int. Cl. B60t *8/26*
U.S. Cl. 303—6 C **6 Claims**

A proportioning valve located in the hydraulic system of a vehicle to control the braking force on the rear wheels with

respect to that on the front wheels. The valve includes a housing which is provided with an inlet chamber connected to one line of the vehicle's dual master cylinder, and an outlet chamber in communication with the rear brakes of the vehicle. The valve is normally open, permitting unimpeded fluid flow between the inlet and outlet chambers, during an initial brake application. However, when the pressure level in the outlet chamber reaches a first value, the valve reacts to restrict the flow between the two chambers so that the pressure level in the inlet chamber rises more rapidly than the



pressure level in the outlet chamber up to a second value of pressure level within the outlet chamber. Upon attaining the second value of pressure level, the valve is acted upon by a pressure responsive member which causes the pressure level in the outlet chamber to increase at a greater rate than the pressure level in the inlet chamber. This pressure level in the outlet chamber continues to build up at this new accelerated rate until the chamber pressures are substantially the same, at which time the valve opens to establish substantially uninterrupted flow between the chambers.

3,790,222

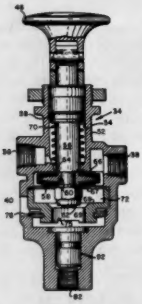
EMERGENCY RELEASE SYSTEM FOR FLUID PRESSURE BRAKES

Richard C. Fannin, Grafton, Ohio, assignor to The Bendix Corporation, South Bend, Ind.

Filed July 24, 1972, Ser. No. 274,137

Int. Cl. B60t *13/10*

U.S. Cl. 303—9 **11 Claims**



In a fluid pressure vehicle brake system of the type having a spring-applied fluid pressure released brake actuator and including conventional service and emergency reservoirs of fluid pressure and wherein the brake actuator is automatically spring-applied upon reduction of service pressure to a predetermined value, the provision of a single manually operable valve for selectively controlling the application of fluid pressure to and from the brake actuator under normal parking conditions and for releasing a spring brake emergency actuation of the actuator when the pressure in the service reservoir drops to the predetermined value.

3,790,223

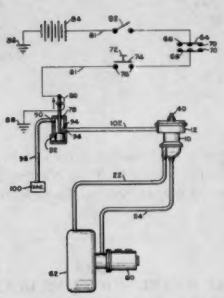
CONTROL SYSTEM FOR BRAKES

John G. Fontaine, 4119 N.E. 6th Ave., Fort Lauderdale, Fla.

Filed Sept. 26, 1972, Ser. No. 292,282

Int. Cl. B60t *7/14*

U.S. Cl. 303—19 **12 Claims**



A control system for controlling the brakes of a motor vehicle including a seat switch for incorporation in the driver's seat of the vehicle, a second switch to be controlled by another function of the vehicle, and a solenoid valve to control a vacuum circuit. The two switches and the coil of the solenoid valve are connected to the battery of the vehicle so that the coil is energized when both switches close and deenergized when either of the switches opens. A vacuum operated metering valve and the solenoid valve are connected in a vacuum circuit with a vacuum source such that deenergization of the coil of the solenoid valve in response to opening of either or both of the switches operates the solenoid valve and the metering valve to apply the main brakes of the vehicle. Thus, if the driver of the vehicle should leave his seat, the brakes are automatically applied. Likewise, if the other predetermined function causes the second switch to be actuated, the brakes are automaticaly applied. This function might be the opening of a door, such as the door of a school bus, or the removal of a nozzle from its cradle on a gas or gasoline truck, by way of example.

3,790,224

MODULATOR FOR ADAPTIVE BRAKING SYSTEM

Irving R. Ritsema, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

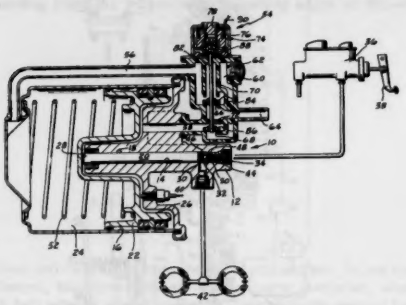
Filed Sept. 14, 1972, Ser. No. 289,194

Int. Cl. B60t *8/02*

U.S. Cl. 303—21 F **2 Claims**

A modulator for an adaptive braking system is disclosed which relieves braking pressure in the brakes of the wheels controlled by the system when an incipient skidding condition is sensed. The modulator includes the usual differential pressure responsive piston slidably mounted within a housing and movable to a position terminating fluid communication to the controlled brakes and thereafter relieving braking pressure when the modulator is actuated. The modulator is controlled by an electrically operated valve which is responsive to the output of the logic controller used in the adaptive braking system. The electrically operated valve normally communicates a pressure differential across the differential pressure

responsive piston which assists the spring which maintains the differential pressure responsive piston in a position permitting fluid communication to the vehicle brakes. However, when an incipient skidding condition is sensed and the electrically



operated valve means is actuated, the latter reverses the pressure differential across the differential pressure responsive piston to urge the latter in opposition to the resilient means to first terminate the braking pressure communication to the controlled brakes and to thereafter relieve braking pressure.

3,790,225

ELECTRICALLY ACTUATED VEHICLE BRAKE SYSTEM

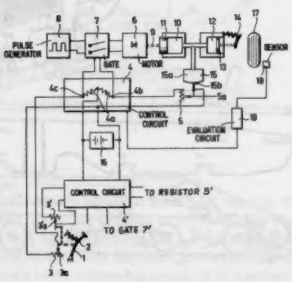
Heinz Wehde, Heidelberg, Germany, assignor to Teldix G.m.b.H., Heidelberg, Germany

Filed Feb. 9, 1972, Ser. No. 224,670

Claims priority, application Germany, June 7, 1971, 2128169

Int. Cl. B60t *8/10, 8/12*

U.S. Cl. 303—21 F **24 Claims**



A brake system for a vehicle has devices responsive to electrical signals for causing the wheel brake cylinders to respond. An electrical position generator which is actuated by a driver during braking produces electrical control signals to initiate brake actuation. Each wheel to be braked has an associated hydraulic unit which defines a variable brake fluid volume and is connected to the respective wheel brake cylinder, so that a change in the brake fluid volume of the hydraulic unit influences the brake pressure in the wheel brake cylinder. A separate measuring device is provided for determining the force exerted on the brake of each wheel to be braked and for producing a corresponding electrical output signal. A separate control signal producing device is operatively arranged to respond to both the signal from the position generator and to the output signal from the separate associated measuring device for producing a control signal. A separate brake actuation device is provided for each wheel to be braked, each of the brake actuation devices being responsive to the control signal from a separate one of the control signal producing devices. Each of the brake actuation devices is operatively arranged to change the brake fluid volume defined by an associated one of the hydraulic units.

3,790,226

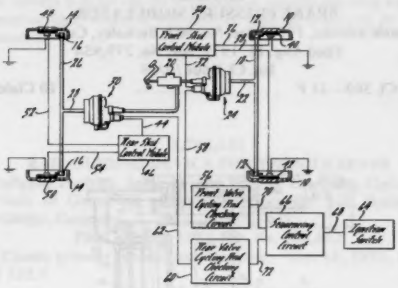
SKID CONTROL SYSTEM INCLUDING CYCLING AND CHECKING CIRCUIT FOR PLURAL MODULATING VALVES

John V. Liggett, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Mar. 1, 1972, Ser. No. 230,852

Int. Cl. B60t *8/00*

U.S. Cl. 303—21 AF **18 Claims**


Front Skid Control Module
Rear Skid Control Module
Front Valve Cycling Skid Checking Circuit
Sequencing Control Circuit
Rear Valve Cycling Skid Checking Circuit
Ignition Switch

A skid control system including a first brake pressure modulating valve for the front wheels, a second brake pressure modulating valve for the rear wheels and an apparatus for automatically cycling and checking the valves in sequence independently of the skid control function in order to prevent deterioration of the valve from inaction. The cycling sequence is established so that both valves are not cycled simultaneously whereby the braking pressure to all of the brakes will not be simultaneously relieved.

3,790,227

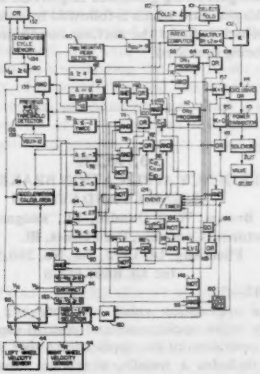
BRAKE CONTROL SYSTEM

Leonard C. Dozier, Birmingham, Mich., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed June 30, 1972, Ser. No. 268,070

Int. Cl. B60t *8/12*

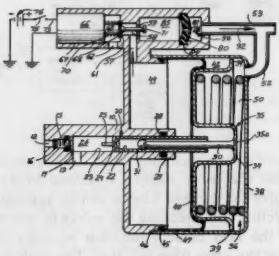
U.S. Cl. 303—21 BE **7 Claims**



A vehicle brake control system effective to modulate braking torque in response to wheel acceleration and deceleration

signals to provide an average braking torque to establish a desired slip ratio between the vehicle tires and the road surface. Upon detection of excessive wheel deceleration during braking, the braking torque is reduced sufficiently to permit the wheel to accelerate. After a predetermined time or upon detection of a predetermined wheel acceleration the braking torque is re-established either at the full level selected by the operator or at a programmed lower level which is increased upon detection of decreased wheel acceleration. The reapplication of braking torque will ordinarily cause the wheel to decelerate with a repetition of the cycle.

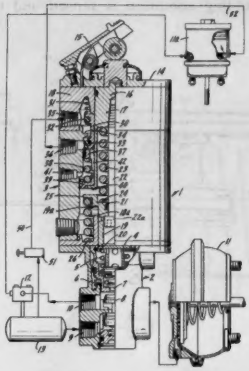
3,790,228
BRAKE PRESSURE MODULATOR
Carmeli Adahan, 1930 Vine, No. 303, Berkeley, Calif.
Filed Aug. 11, 1972, Ser. No. 279,934
Int. Cl. B60t *13/68*
U.S. Cl. 303—21 F **10 Claims**



A brake pressure modulator for use in a skid control system in which a sliding plunger controls communication between the master cylinder and the wheel cylinders and also the release and reapplication of brake pressure in response to signals indicating the presence or absence of a potential wheel locked condition. The plunger is supported for movement by a diaphragm assembly in a manner permitting rapid response to differential pressures acting thereon; the differential pressure following release of the brakes in response to an impending wheel lock signal being governed to provide an initially rapid rise in brake pressure which is followed by a more gradual rise at a rate which reflects the surface conditions on which the vehicle is being operated.

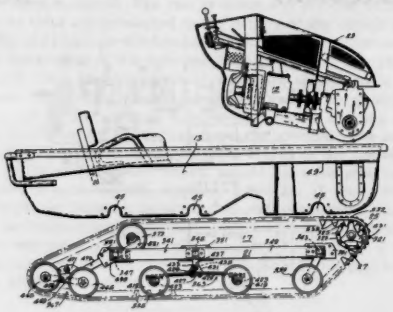
3,790,229
EMERGENCY APPLICATION BRAKE VALVE ASSEMBLY AND SYSTEM
Curtis L. Brown, West Dundee, Ill., assignor to The Berg Manufacturing Company, Des Plaines, Ill.
Filed Aug. 14, 1972, Ser. No. 280,512
Int. Cl. B60t *15/06*
U.S. Cl. 303—52 **6 Claims**

A brake application valve assembly and system having emergency brake application and control elements operable with each operation of the application valve. The brake valve assembly includes a treadle, a service valve structure, an emergency valve structure between the treadle and the service valve structure, and a shaft movable in response to movement of the treadle and extending into the emergency valve structure. In addition, the brake assembly includes a piston positioned in the emergency valve structure for movement in



response to movement of the shaft and against elements in the application valve structure to operate the application valve structure.

3,790,230
ALL-TERRAIN VEHICLE
Herbert A. Jespersen, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.
Division of Ser. No. 857,494, Sept. 12, 1969, abandoned. This application Nov. 27, 1970, Ser. No. 93,474
Int. Cl. B62d *55/16*
U.S. Cl. 305—22 **7 Claims**

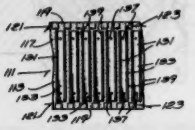


Disclosed herein is an all-terrain vehicle including a track suspension system affording both transverse and lateral resiliently flexible support to an endless track and a releasably locked and pivotally mounted rear bogie wheel assembly which, when pivoted from its normal operating position, affords assembly of or removal of the endless track relative to the sprocket and bogie wheels.

3,790,231
SNOWMOBILE TRACK
Edgar Rose, Glencoe, Ill., assignor to Outboard Marine Corporation, Waukega, Ill.
Filed July 7, 1971, Ser. No. 160,408
Int. Cl. B62d *55/24*
U.S. Cl. 305—35 EB **1 Claim**

Disclosed herein is a vehicle track comprising an elongated flexible belt having parts extending from the belt side edges

and projecting outwardly from the main weight supporting belt outer surface, together with a plurality of rigid traction bars which extend transversely of the belt between the outwardly projecting belt parts and which include a web portion secured to the belt outer surface and a pair of spaced flanges extending from the transversely extending edges of the web



portion and outwardly from the belt outer surface. In one embodiment, the outwardly projecting parts comprise, along each belt edge, a row of uniformly longitudinally spaced lugs and the traction bars extend with their ends received between and in abutting relation to adjacently located pairs of lugs in each row of lugs.

3,790,232

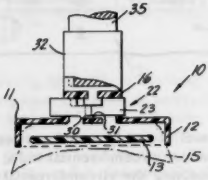
HANDLE CONNECTION

Vicente Alvarez, San Jose 102-4° C, Zarogoza, Spain

Filed June 4, 1971, Ser. No. 149,919

Int. Cl. B25g *3/04*

U.S. Cl. 403—192 **2 Claims**



A handle connection having a socket to receive the end of the handle and carrying a male bayonet fitting thereon. A head for a device such as a mop has a female bayonet socket thereon to receive the male bayonet connection member and a lock is adapted to be releasably engaged in a groove extending across the male bayonet member to lock the male bayonet member in the female socket. A plate is detachably connected to the head for securing a mop member to the head.

In modified forms of the invention the bayonet lock members are secured in engaged position by rings detachably engaged over the connection.

3,790,233

ANTIFRICTION SLIDE ASSEMBLY

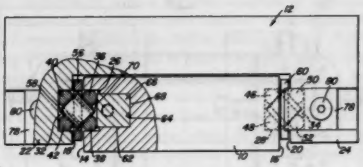
Edward C. Polidor, Rochester, N.Y., assignor to Automation Gages, Incorporated, Rochester, N.Y.

Filed Nov. 10, 1971, Ser. No. 197,313

Int. Cl. F16c *21/00*

U.S. Cl. 308—6 R **1 Claim**

This antifriction slide assembly comprises two members slidable relative to one another and mounted on roller bearings which roll on the flat surfaces of diagonally opposite rods mounted in confronting grooves of the two members. Alternate rollers are disposed so that their axes are inclined in opposite directions; and all the rollers are hollow. Pre-load on



the rollers is achieved by longitudinal adjustment of a wedge member that contacts the pair of rods in a groove of one member.

3,790,234

RAIL GUIDING DEVICE FOR VEHICLE SEATS

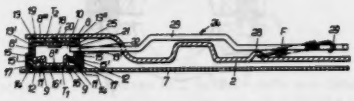
Wolfgang Fuelling, Solingen, and Werner Osenberg, Opladen, both of Germany, assignors to Bremsley AG, Solingen-Ohligs, Germany

Filed May 23, 1972, Ser. No. 256,112

Claims priority, application Germany, Nov. 18, 1971, P 21 57 232.7

Int. Cl. F16c *29/00*

U.S. Cl. 308—6 R **7 Claims**



A rail guiding device for a vehicle seat comprising a first rail part which is to be fixed in position, and a second rail part which can move in relation to it, one of said parts at least partially enveloping the other, the enveloping rail part extending into longitudinal grooves in the enveloped rail part to provide an interlocking action, the rail part having the longitudinal grooves being made in box girder form, and fixed externally placed support faces are provided for two opposite limbs of the enveloping rail part. The support surfaces are preferably formed by the limbs, overlapping the side flanks of the enveloping rail part, of an outer, third rail, the third rail being U-shaped in cross-section and having a web which is connected with the wall section of the enveloped rail part extending between the longitudinal grooves in the enveloped rail part.

3,790,235

CENTRALLY FREE GIANT BEARING

Theodor Kaiser, Hagen-Kabel, Germany, assignor to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

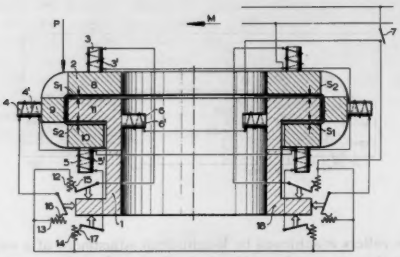
Filed Dec. 18, 1972, Ser. No. 316,139

Int. Cl. F16c *39/06*

U.S. Cl. 308—10 **2 Claims**

A centrally free giant bearing for absorbing axial and radial loads as well as loads caused by moments, in which a protru-

sion of a nose ring is embraced on three sides by a two-sectional supporting ring which at its bearing surfaces is provided



with circumferentially distributed controllable electromagnets, whereas the nose ring is provided with circumferentially distributed non-variable electromagnets.

3,790,236

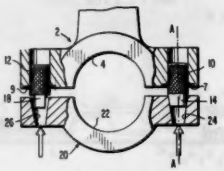
ALIGNMENT MEANS AND METHOD

Bernard N. Pierce, West Hartford, Conn., assignor to The Merrow Machine Company, Hartford, Conn.

Filed Mar. 6, 1972, Ser. No. 231,806

Int. Cl. F16c *43/00*

U.S. Cl. 308—23 **16 Claims**



Two separable members are aligned by bringing them together while guiding one side of both members into alignment with respect to a linear axis, and guiding the other side of the members into an aligned position in an arcuate path centered about the aforesaid linear axis without interfering with movement in a direction normal to the linear axis. Guidance with respect to the linear axis is performed by an axial alignment pin frictionally retained in one of the bearing segments and having a projecting conical surface for engaging within an aperture in the other member. Guidance in the arcuate path is performed by a tapered lateral positioning pin frictionally retained in one of the members and engaging an aperture in the other member only at spaced apart portions so as not to interfere with the guiding function performed by the first pin. On the first occasion when the members are assembled, the untapered end of the pins are forced into their supporting member to locate accurately the projecting tapered portion.

3,790,237

ELASTIC PIVOT BEARING

Henri Quaile, and Paul Piguet, both of La Chaux-de-Fonds, Switzerland, assignors to Portescap, La Chaux-de-Fonds, Switzerland

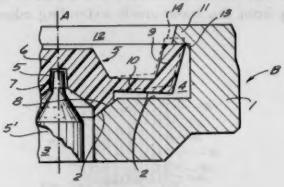
Filed Dec. 26, 1972, Ser. No. 318,562

Claims priority, application Switzerland, Dec. 23, 1971, 18810/71

Int. Cl. F16c *27/08, 33/00*

U.S. Cl. 308—159 **12 Claims**

An anti-shock bearing assembly has a relatively rigid housing in which a one-piece elastic bearing element is positioned and held in a stressed condition due to the relative configurations of the housing and bearing element. The housing and bearing element also have centrally located complementary



conical surfaces which cooperate to return the bearing element to its proper-centered position in the housing, after a shock, under the influence of the stress forces imposed on the bearing element by the housing configuration.

3,790,238

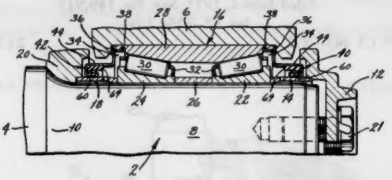
BEARING SEAL ASSEMBLY

Dennis L. Otto, Malvern, Ohio, assignor to The Timken Company, Canton, Ohio

Division of Ser. No. 135,168, April 19, 1971, Pat. No. 3,729,789. This application Sept. 15, 1972, Ser. No. 289,690

Int. Cl. F16c *33/78*

U.S. Cl. 308—187.1 **12 Claims**



A bearing seal assembly includes a seal case having large and small diameter circumferential walls, a radial connecting wall interconnecting the circumferential walls, and a radial end wall at the outermost end of the small circumferential wall. The free end of the large circumferential wall is press fitted into a socket at the end of a bearing cup so that the small diameter wall projects away from the bearing cup and the bearing cone encircled by that cup. The seal assembly further includes an elastomeric seal having a supporting portion which is bonded to the inner surfaces of the small circumferential wall and the radial end wall. The supporting portion is joined to a seal lip through a web, and that lip engages a wear surface as the cone and cup of the bearing rotate relative to one another. The supporting portion is provided with a shoulder which faces the interior of the bearing and provides a seat against which a removal tool bears for detaching the seal assembly from the bearing cup. The supporting portion is bonded to the seal case for substantial distances on each side of the shoulder so that the removal force does not separate the seal case and the seal.

3,790,239

SELF-LUBRICATING ANTI FRICTION BEARINGS

Raymund Wilhelm Laux, and Reinhold Sauer, both of c/o Dow Corning G.m.b.H., Munich, Germany

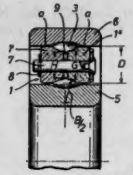
Filed June 15, 1972, Ser. No. 263,324

Int. Cl. F16c *33/00*

U.S. Cl. 308—206 **2 Claims**

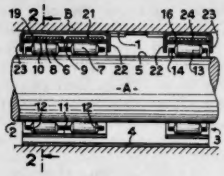
Self-lubricating roller and ball bearing structures are described in which the ball or roller elements are lubricated by

means of rotatable spacing inserts positioned between the balls or rollers in sliding contact therewith. The spacing inserts



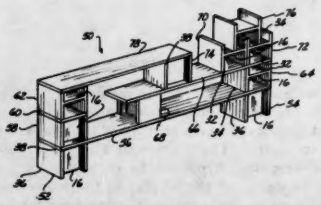
are made of a polymeric self-lubricating composite containing dry lubricants interspersed throughout the polymer.

3,790,240
ROLLING BEARING ASSEMBLY WITH A REDUCED OPERATIONAL CLEARANCE
Alfred Pitner, Paris, France, assignor to Nadella, Malmaison, France, a part interest
Filed Dec. 21, 1972, Ser. No. 317,218
Claims priority, application France, Jan. 10, 1972, 7200597
Int. Cl. F16c *13/00*
U.S. Cl. 308—207 **23 Claims**



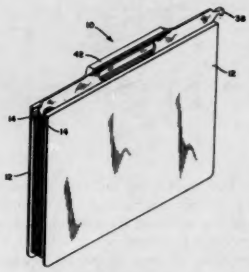
Radial rolling bearing assembly comprising a bore which supports, in angularly spaced regions, at least two respectively rigid and resilient supports for two adjoining bearing rings defining two outer raceways respectively for two annular rows of rolling elements guided in cage apertures. The resilient and rigid supports reduce the radial clearance for the rolling elements between the two outer raceways and a shaft.

3,790,241
MODULAR FURNITURE STRUCTURE
Joseph T. Messina, General Delivery, Normantown, W. Va.
Filed July 20, 1972, Ser. No. 273,410
Int. Cl. F16b *12/00;* **A47b** *77/00*
U.S. Cl. 312—111 **11 Claims**



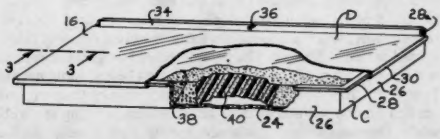
A modular furniture structure comprising a plurality of furniture modules, each module having a pair of square sidewalls connected at a point offset from their mid-section by a transverse wall member to form a cubic envelope having an H-shaped cross section. The furniture modules may be stacked one upon the other with the edges of the sidewalls of one furniture module being adapted to support the edges of the module thereabove with a selected number of the modules being disposed at different orientations with respect to adjacent furniture modules to define different shelf depth and shelving configurations with at least one horizontally disposed transverse shelf member being carried between a pair of horizontally spaced furniture modules. The furniture modules may be so arranged as to have their sidewalls interlocking in a selected manner with the upper edges of the sidewalls supporting a horizontally disposed member to form a table, desk or the like.

3,790,242
BINDER CARRIER AND SUPPORT STRUCTURE
John L. Sullivan, Floral Park, N.Y., assignor to The Mead Corporation, Dayton, Ohio
Filed Jan. 24, 1972, Ser. No. 220,276
Int. Cl. B42f *15/04*
U.S. Cl. 312—184 **7 Claims**



A carrier for attachment to a binder, such as a binder for computer print-outs, and supporting structure for the carrier. The carrier includes a carrying handle, a first pair of hooks for engaging the binder posts without opening the binder, and a second set of hooks for engaging a rack. The handle includes an enlarged portion extending along an edge of the carrier and a cutout beneath the enlarged portion which can be used either to accomodate the fingers of a person holding the carrier or for engagement with a supporting rack. A specially designed support structure may be used with the carrier which includes a channel having inwardly directed, spaced side wall edges adapted to engage the enlarged portion of the carrier handle.

3,790,243
CLOSURE FOR REFRIGERATED HOUSING
Robert B. Whorton, III, Spartanburg, S.C., assignor to Beverage-Air Sales Company, Spartanburg, S.C.
Filed Mar. 30, 1972, Ser. No. 239,469
Int. Cl. F25d *17/00, 23/06*
U.S. Cl. 312—214 **1 Claim**



A closure for a refrigerated housing and the like, having a rectangular opening in an upper wall thereof. A planar door

having opposed flanges extending from opposite sides rides on glide strips carried adjacent the rectangular opening. The planar door includes a lower member, and an upper member with insulation carried therebetween. The upper member is attached to the lower member so that the upper member can expand to a different degree from said lower member without said door buckling. A thin plastic sheet is carried between the upper member and the insulation so as to permit the upper member to substantially float when expanding relative to the lower member.

3,790,244

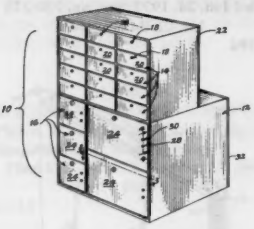
MAILBOX UNIT

Wells F. Stackhouse, Ashville, N.Y., assignor to American Locker Company, Inc., Jamestown, N.Y.

Filed Aug. 10, 1972, Ser. No. 279,636

Int. Cl. E05b *65/46*

U.S. Cl. 312—215 **3 Claims**



A mailbox unit permitting delivery and safe storage until pickup of both letters and packages to tenants of multiple tenant buildings. The unit employs conventional tenant key controlled letter boxes in combination with large sized package storage cabinets, which may be opened by a tenant with a special key placed in his letter box by the mailman.

3,790,245

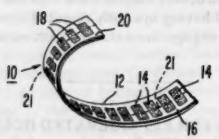
DOUBLE-SIDED HOLOGRAPHIC REPLICAS

William James Hannan, Palm Beach Gardens, Fla., and Joseph Ralph Frattarola, Hightstown, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 12, 1972, Ser. No. 296,861

Int. Cl. G02b *27/00*

U.S. Cl. 350—3.5 **6 Claims**



A double-sided, holographic replica comprises a web of transparent, thermoplastic, sheet material having a separate series of off-axis-recorded, phase-modulated holograms pressed into each of the opposite surfaces, respectively, of the web. Oppositely disposed (front and rear) holograms are such as to provide angularly displaced reconstructed images, respectively, when a monochromatic read-out beam is transmitted through the web. The double-sided holographic replica is made by first pressing the web and a first holographic master between a first pair of heated calender rollers to form one replica on one surface of the web, and then pressing the web, while thermoplastically adhered to the first master, and a second holographic master between a second pair of heated calender rollers to form another replica on the other surface of the web. The first and second masters are subsequently cooled and separated from the web.

3,790,246

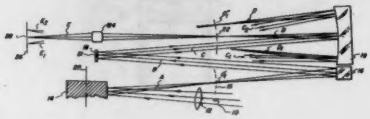
X-Y OPTICAL SCANNING SYSTEM

Royce Dean Pickering, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 26, 1971, Ser. No. 192,452

Int. Cl. G02b *17/00*

U.S. Cl. 350—7 **9 Claims**



A system for X-Y scanning and recording on a light responsive storage medium. The system comprises a suitably modulated light source, a first rotating deflecting element, for example, a flat faceted mirror wheel, and a second rotating deflecting element, for example, a flat or concave mirror. The axes of rotation of the two rotating deflecting elements are substantially mutually perpendicular. Alternatively the axes of rotation can be at another chosen angle to one another. Operatively disposed along the optical axis between the first and second rotating deflecting elements is a first field mirror which is preferably of the concave spherical type. Operatively disposed between the second rotating deflecting element and the recording medium is a second field mirror which is also preferably concave spherical. The concave mirrors serve to image both scanning mirrors at the entrance pupil of a final lens. This arrangement allows all of the incident light to pass through the final lens. Small mirror faces can be used and a small stationary beam such as from a laser is easily scanned. An image which is essentially free of distortion and curvature of field can be obtained on a flat storage medium.

3,790,247

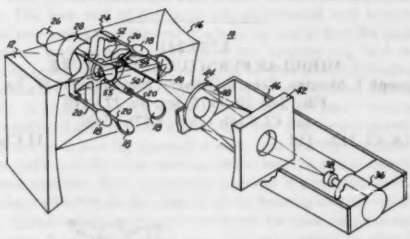
ALL REFLECTIVE IMAGE SPACE SCANNING DEVICE

Dietrich Korsch, Ann Arbor, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed June 9, 1972, Ser. No. 261,461

Int. Cl. G02b *17/00*

U.S. Cl. 350—7 **5 Claims**



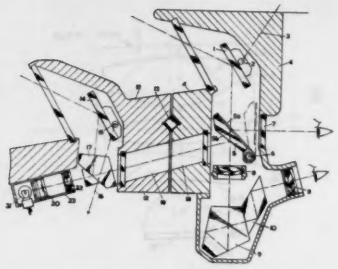
The illustrated scanning device includes a rotatable wheel having six scanning mirrors mounted thereon disposed between a spherical primary mirror and the image provided by the primary mirror. The portion of the wheel nearest the image approximates a hyperbola having a front focal point offset from the center of the wheel. As the wheel rotates and sequentially moves the scanning mirrors along the hyperbola, each mirror reflects image information along a line across the image to the front focal point of the hyperbola. A small mirror is disposed at the focal point to reflect light toward a remote detector.

3,790,248

TARGET SIGHTING SYSTEMS

Allan Neville Kellow, 124, Selbourne Ave., New Haw, Weybridge, Surrey, England

Filed Sept. 7, 1971, Ser. No. 178,204
Int. Cl. G02b 27/32, 23/08
U.S. Cl. 350—10 9 Claims



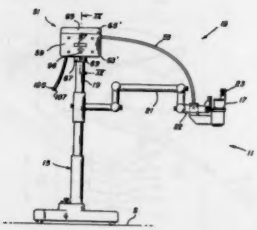
A target sighting system, principally for a fighting vehicle having a main armament which can be aimed by a gunner by means of a sighting periscope rotatable in azimuth, is provided with a separate periscope, principally for a vehicle commander, which can be independently rotated in azimuth, and optical passageways in each periscope system which provide a direct optical path between the periscopes when they are aligned in azimuth so that the view through the gunner's periscope can be observed through the other periscope.

3,790,249

ILLUMINATING MEANS FOR OPERATING MICROSCOPE

Harry T. Treace, Germantown, Tenn., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.

Filed Oct. 2, 1969, Ser. No. 863,062
Int. Cl. G02b 21/06
U.S. Cl. 350—91 7 Claims



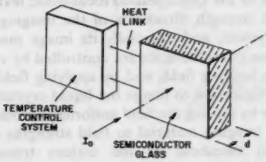
An illuminating system for an operating microscope having a stand, a head assembly including an optical system and an arm supporting the head assembly. The illuminating system includes a light source located in spaced relationship to the head assembly and an elongated flexible fiber optic light guide having one end located adjacent the light source and the other end mounted on the head assembly for transmitting light from the light source to the head assembly for use in illuminating the operating area.

3,790,250

THERMALLY-ACTIVATED OPTICAL ABSORBER

Dean L. Mitchell, Oxon Hill, Md.; Stephen G. Bishop, Arlington, and Craig Taylor, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1971, Ser. No. 174,828
Int. Cl. G02f 1/36
U.S. Cl. 350—160 R 9 Claims



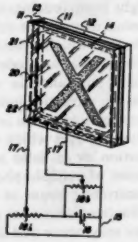
An optical device comprising a glassy material which exhibits temperature-dependent optical absorption properties. The intensity of radiation beams which are transmitted through the material is thermally controlled so that the device can attenuate, modulate, or become opaque to the transmitted radiation.

3,790,251

HOLDING FIELD TO IMPROVE THE IMAGE RETENTION OF A CHOLESTERIC NEMATIC PHASE TRANSITION LIQUID CRYSTAL IMAGING SYSTEM

Joseph J. Wysocki, Webster; James H. Becker, Penfield, and Gary A. Dir, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 47,698, June 19, 1970, abandoned. This application Nov. 29, 1971, Ser. No. 202,746
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC 22 Claims



An imaging system including an imaging layer comprising cholesteric liquid crystalline material in an electrical field

capable of having field strengths in the cholesteric nematic phase transition field strength range or the Grandjean to focal-conic texture transformation field strength range of the liquid crystalline imaging material. The imaging material is typically imaged by placing an imagewise phase-transition or texture-transformation inducing electrical field across a layer of imaging material. The present invention controls such an imaging system by maintaining a substantially uniform holding field across the entire surface of the imaging material, said holding field typically being maintained across the imaging material after it has been imaged. The holding field may be applied in the form of various phenomena. The particular type of holding field applied has field strengths below the cholesteric-nematic phase transition or the Grandjean to focal-conic texture transformation field strength thresholds of the imaging material. The imaging system, and especially its image memory and image relaxation characteristics are controlled by varying the strength of the holding field, and by applying field pulses in imagewise configuration to image the liquid crystalline imaging material, or by pulsing the field uniformly across the entire surface of the imaging material to field strengths above the phase-transition threshold or the texture transformation threshold, thereby enhancing the image already formed in the imaging material.

3,790,252

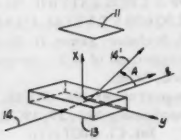
LIGHT CONTROLLED LIGHT BEAM DEFLECTOR

Yoh-Han Pao, Cleveland Heights, Ohio, assignor to Case Western Reserve University, Cleveland, Ohio

Continuation-in-part of Ser. No. 7,609, Feb. 2, 1970, abandoned. This application Feb. 23, 1972, Ser. No. 228,635

Int. Cl. G02f *1/32*

U.S. Cl. 350—160 R **27 Claims**



Deflection of a light beam is achieved by changing in a spatially non-homogeneous manner the refractive index of an interaction medium through which a controlled light beam and a controlling light beam pass at an angle to each other. The interaction medium is a substance in which large and rapid reversible changes in the refractive index may be produced by optical means. More specifically, the interaction medium consists of optically saturable dyes which may be either in liquid form that is in solution or in solid solution that is cast in plastics or may consist of suitable photoconductors. Optical pumping by the controlling beam at one frequency causes large changes in refractive index over a broad wavelength region and the changes may occur and decay in as short a time as 10^{-12} seconds.

3,790,253

Patent Not Issued For This Number

3,790,254

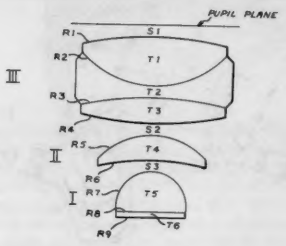
MICROSCOPE CONDENSER SERIES

Edward B. Rybicki, Buffalo; Milton H. Sussman, Amherst, and Robert B. Tackaberry, Williamsville, all of N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Sept. 7, 1972, Ser. No. 287,133

Int. Cl. G02b *21/08*

U.S. Cl. 350—183 **10 Claims**



A related series of interchangeable phase condensers of substantially the same focal length having compatible parfocality, but having different working distances. The series of condensers being of such a design that ordinary correction of the image plane is within at least two wave lengths of light; the condensers being well corrected for field aberration including coma, and pupil aberration including coma; said condensers having their respective pupil positions substantially external to the glass thereof. By "substantially external" is meant all of the condensers have their annulii, aperture stops and focal plane positions substantially coincident.

3,790,255

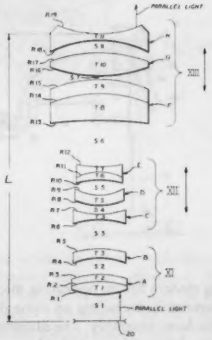
ZOOM LENS SYSTEM

Arthur H. Shoemaker, E. Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Sept. 11, 1972, Ser. No. 288,231

Int. Cl. G02b *15/16*

U.S. Cl. 350—184 **3 Claims**



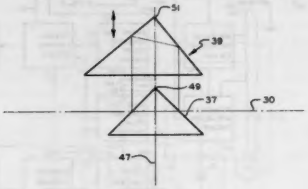
An eight component afocal zoom system is provided characterized by extremely short length considering the zoom range and its field and aperture size. A substantially flat image field is obtained through a zoom range of substantially to 2.54.

3,790,256

ROLL AND FOCUS APPARATUS

Richard A. Mecklenborg, Binghamton, and Richard E. McClenahan, Johnson City, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,035
Int. Cl. G02b 7/18
U.S. Cl. 350—287 9 Claims



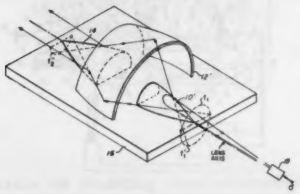
A silvered right-angle prism and a corner cube prism are combined to form an optical device capable of introducing image roll, a change in path length for focusing and optical oxis offset. Incident rays are reflected by one side of the right angle prism to the corner cube prism where after three internal reflections they exit to reflect off the other side of the right angle prism. By controlling the distance between the two prisms path length is changed. Movement of the prisms with respect to each other in the other two translational degrees shifts the optical axis and rotation of the combined prisms will result in image roll.

3,790,257

CONDUCTIVELY COOLED CATOPTRIC LENS ARRANGEMENT

Irving Goldstein, Lexington, and Werner R. Rambauske, Carlisle, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 1, 1971, Ser. No. 203,811
Int. Cl. G02b 5/10
U.S. Cl. 350—294 1 Claim



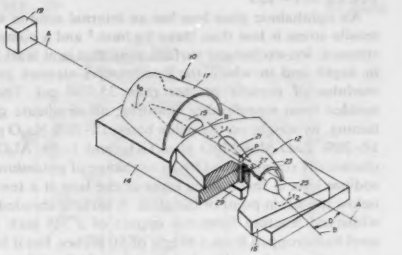
A catoptric lens arrangement which is adapted to use with high power radiant energy, as from a laser, is shown. The entrance mirror of the contemplated lens arrangement has a convex reflective surface so that the radiative flux density at the entrance mirror is less than the radiative flux density in a laser beam. The various mirrors in the contemplated lens arrangement further are arranged so that each such mirror may be conductively cooled with aperture blockage reduced to a minimum or eliminated altogether.

3,790,258

STEERABLE CATOPTRIC LENS ARRANGEMENT

Werner R. Rambauske, Carlisle, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 20, 1972, Ser. No. 246,045
Int. Cl. G02b 5/10
U.S. Cl. 350—294 6 Claims



Catoptric lens arrangements for changing the direction of a beam of wave-propagated energy are shown. In one class of embodiments, the beam is directed through an entrance lens assembly toward a first focal point. A steering lens assembly, the first mirror therein having a focal point coincident with the first focal point, is arranged to be moved relative to the entrance lens assembly to affect the desired steering. In another class of embodiments, the entrance beam lens assembly is adapted to produce a collimated beam at a fixed angular deviation from the entrance beam and the steering lens assembly is adapted to be moved relative to such collimated beam to effect the desired steering.

3,790,259

EYE PROTECTION FRAME ASSEMBLY

Conrad L. Leblanc, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Aug. 14, 1972, Ser. No. 280,297
Int. Cl. G02c 5/16, 5/22; E05d 3/02
U.S. Cl. 351—113 4 Claims

An eye protection frame assembly including means for connecting a pair of temple members to a front lens retaining portion. The temple members are each pivoted to an open position and then further spread apart by applying biasing force against a spring member so that they may slip around the wearers head. The spring members then urge the temples back toward one another resulting in a snug fit on the wearers head.

3,790,260

HIGH STRENGTH OPHTHALMIC LENS

David C. Boyd, Corning, and Joseph M. Williams, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 215,075, Jan. 3, 1972, abandoned. This application July 31, 1972, Ser. No. 276,725
Int. Cl. G02c 7/02
U.S. Cl. 351—159 4 Claims

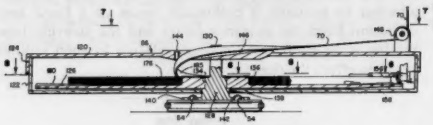
An ophthalmic glass lens has an internal zone in which the tensile stress is less than three kg./mm.^{2} and a compressively stressed, ion-exchanged surface zone that is at least four mils in depth and in which the compressive stresses generate a modulus of rupture greater than 35,000 psi. The lens is molded from a preferably lime-free, alkali silicate glass containing, by weight on the oxide basis, 12–20% Na_2O plus K_2O, 10–20% ZnO plus MgO plus TiO_2, and 1–5% Al_2O_3, and is chemically strengthened by an exchange of potassium ions for sodium ions in the surface layer of the lens at a temperature below the strain point of the glass. A surface abraded lens will withstand fracture from the impact of a 5/8 inch diameter steel ball dropped from a height of 50 inches, but if broken by a point impact, has a breakage pattern of a few large pieces.

3,790,261

LONG PLAY FILM CARTRIDGE AND PROJECTOR

Richard James Threlkeld, 6736 Tobias, Van Nuys, Calif.

Filed May 17, 1973, Ser. No. 361,283
Int. Cl. G03b 23/02
U.S. Cl. 352—72 17 Claims



A long play film cartridge and projector wherein an endless loop of film may be nine hundred to 5,000 feet or more in length and which may be used to project a series of pictures continuously; the cartridge having a novel dish shaped film holding rotor of a material having a particular coeficient of surface friction with radiating film supporting ridges having upper surfaces declining downwardly from the outer periphery towards a central hub which is surrounded by a flat ring shaped surface portion with which the inner ends of said ridges are substantially flush, whereby a large spiral roll of film is carried on said film holding rotor and is fed therefrom near said hub where the relative center of said spiral roll is automatically maintained in loosely packed convolutions; said projector operated at a lower linear film rate than the linear film rate of said film holding rotor and the film holding rotor is actuated intermittently in response to tension on displacement of said film created by demand of said projector.

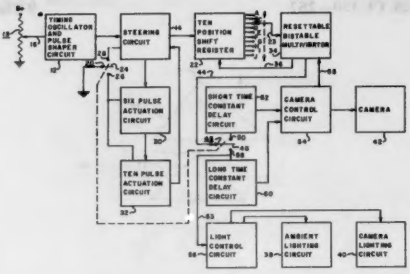
3,790,262

CAMERA CONTROL SYSTEM

Glen A. Van Derwater, Jr., Penfield, N.Y., assignor to Photographic Sciences Corporation, Rochester, N.Y.

Filed May 9, 1972, Ser. No. 251,778
Int. Cl. G03b 21/32
U.S. Cl. 352—84 13 Claims

A camera control system for time lapse photography includes an adjustable frequency timing oscillator coupled through a steering circuit to a shift register. The shift register has a pluarity of output terminals which are sequentially energized in response to input signals from the steering circuit. A control circuit is connected to a selected register output terminal and controls the operation of a camera function, in addition to the ambient lighting and camera lighting when the selected terminal is energized. The steering circuit and an associated pulse actuation circuit are adjustable for two modes



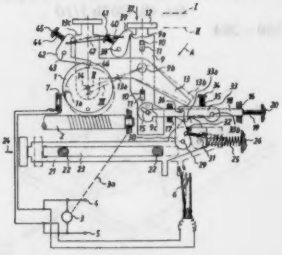
of operation. In the first mode of operation, an input signal is applied to the shift register for every cycle of the oscillator output signal, and in the second mode of operation, an input signal is applied to the shift register for every sixty cycles of the oscillator output signal.

3,790,263

MOTION PICTURE CAMERA WITH FADING MEANS

Siegfried Werz, Munich, and Johann Zanner, Jr., Unterhaching, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 28, 1972, Ser. No. 238,763
Claims priority, application Germany, Mar. 29, 1971, 2115207; Aug. 14, 1971, 2140813
Int. Cl. G03b 21/36
U.S. Cl. 352—91 23 Claims



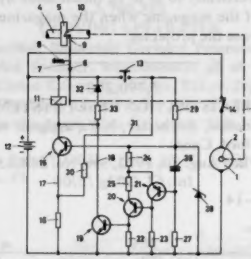
A motion picture camera wherein the fading means is prepared for operation by a setting unit which can be actuated by hand to thereby change the condition of the fading means to a condition of readiness. The making of trick shots begins in response to return movement of the camera release element to its idle position; an adjusting device of the fading means is then operatively connected with the diaphragm so that the size of the light-admitting aperture of the diaphragm changes whereby the camera makes exposures with fade-out or fade-in effect, or first with fade-out and thereupon with fade-in effect.

3,790,264

MOVIE CAMERA RELEASE CONTROL CIRCUIT WITH VOLTAGE STABILIZATION

Frank-Armin Heinrich, Korb, Germany, assignor to Robert Bosch Photokino GmbH, Stuttgart, Germany

Filed June 8, 1972, Ser. No. 261,039
Claims priority, application Germany, July 7, 1971, 2133704
Int. Cl. G03b 1/00
U.S. Cl. 352—174 7 Claims



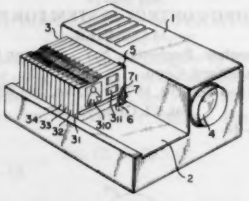
Activation of the camera release button causes a first transistor to become fully conductive, furnishing a high energizing current to the release magnet. A timing circuit connected to the transistor causes cut-off of the transistor after a predetermined time interval. A second transistor furnishing a decreased holding current then becomes activated. A Zener diode serves to stabilize the voltage for both transistors, causing the circuit to be independent of battery voltage variations.

3,790,265

AUDIO-VISUAL APPARATUS

Mitsutoshi Ogiso; Kazuo Tshikawa, both of Kawasaki, and Yoshihiro Shigeta, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1971, Ser. No. 189,869
Claims priority, application Japan, Oct. 20, 1970, 45/92181
Int. Cl. G03b 31/06
U.S. Cl. 353—19 10 Claims



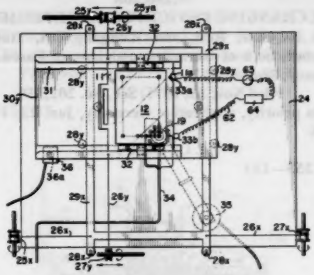
An apparatus for presenting visual information and corresponding audio information simultaneously utilizes an audio-visual slide which includes a transparency for projection and a movable endless magnetic tape of relatively great recording capacity. The apparatus includes projecting means for the transparency of the slide, driving means for moving the slide to the projecting position in the projecting means and returning the slide to its original position, tape driving means for driving the magnetic tape in the slide when the slide is in the projecting position, and reproducing means adapted to be urged into contact with the magnetic tape to reproduce audio information on a spiral track of the tape with the aid of a magnetic head.

3,790,266

MICROFICHE PROJECTING APPARATUS

Hiroyuki Ueda, and Yukio Sawano, both of Asaka, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Kanagawa-ken, Japan

Filed Oct. 12, 1971, Ser. No. 188,228
Claims priority, application Japan, Oct. 24, 1970, 45/93662; Nov. 5, 1970, 45/97350
Int. Cl. G03b 23/08, 1/52, 21/28
U.S. Cl. 353—27 8 Claims



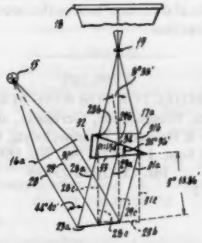
In an apparatus for projecting a microfiche, a microfiche holder is demountably mounted on a stage which is movable in a horizontal plane. The microfiche holder is formed with a notch and positioned on the stage, with said notch being engaged by a stopper pin provided on said stage. In changing the microfiche holder, the stage is fixed and a focal plane determining member for retaining the microfiche on the focal plane is moved out of contact with the microfiche.

3,790,267

OPTICAL SYSTEM FOR ORTHOGONALIZING IMAGE FIELD OF PROJECTION LENS

Edward G. Ramberg, Southampton, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 17,412, March 9, 1970, abandoned.
This application July 14, 1972, Ser. No. 271,934
Int. Cl. G03b 21/00, 21/14; G02f 1/30
U.S. Cl. 353—70 11 Claims



Light from an unmodulated source is collimated and angularly directed to a target reflecting surface which is deformable to represent a subject and from which it is directed by a schlieren projection system including a projection lens and a stop at the focal point of the lens for the subject representative light which is angularly reflected from the target surface. A prism is placed between the target and the projection lens to effectively render the image represented by the principal light rays reflected from the target substantially orthogonal to the principal plane of the lens. For monochromatic light a simple

triangular prism is used and for polychromatic or white light a compound prism of trapezoidal shape and comprising at least two components with different indices of refraction is used. A preferred form of the compound prism is of trapezoidal shape and comprises three components, two of the components having a third component having a different index of refraction. In one of the three-part compound prisms the components are of glass materials and in another form of such a prism the components are of optical plastic materials.

3,790,268

SLIDE CHANGING DEVICE FOR SLIDE PROJECTORS

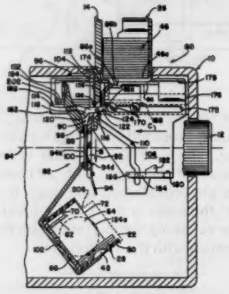
Clemens Hopener, Ruit, and Wolfgang Ort, Stuttgart-bad Cannstatt, both of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,359

Claims priority, application Germany, Jan. 22, 1971, P 21 02 927.6

Int. Cl. G03b *23/02*

U.S. Cl. 353—111 **6 Claims**



A slide projector includes means for receiving a vertical slide stack. A device for indexing the lowermost slide to a film gate and then to a receptacle for receiving viewed slides includes a first slide member which is movable vertically past the gate to push slides out of the gate toward the receptacle. A second slide member is movable horizontally to index the lowermost slide of the stack to a chute. The slide drops along the chute into the film gate. The first and second slide members are interconnected so that movement of the first slide member in a vertical direction moves the second slide member in a horizontal direction.

3,790,269

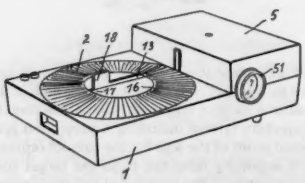
SLIDE PROJECTOR FOR RING MAGAZINES

Reinhard Sobotta, Mascherode, Germany, assignor to Roller-Werke Franke & Heidecki, Brannschweig, Germany

Filed Sept. 14, 1971, Ser. No. 180,400

Int. Cl. G03b *23/06*

U.S. Cl. 353—117 **4 Claims**



A slide projector for use with ring-shaped magazines arranged horizontally for rotation about a vertical axis offset laterally from the horizontal optical axis. As the magazine rotates step by step, an inclined ramp raises the slide which is to be projected so that its bottom edge will clear the rather low marginal wall of the ring-like magazine. A pusher member which extends beneath the bottom of the magazine, then up through the central stationary hub around which the magazine rotates, then radially toward the projection window, engages the edge of the slide, and pushes it radially into the projection window or gate on the optical axis, through a guide member which is beveled horizontally to receive the advancing edge of the slide and align it properly, and which is pivotally mounted and beveled vertically so as to be thrust aside by vertical axial movements of the magazine when the magazine is inserted in or removed from the projector.

3,790,270

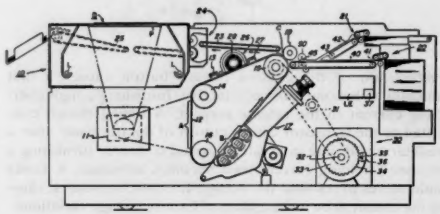
REGISTRATION RESET SYSTEM

James M. Donohue, Rochester, N.Y., assignor to Xerox Company, Stamford, Conn.

Filed Aug. 30, 1972, Ser. No. 284,831

Int. Cl. G03g *15/00*

U.S. Cl. 355—14 **8 Claims**



A programming control system for controlling the processing steps of an electrostatic printing machine of the type employing an endless photoreceptor belt. A sheet position sensitive element in the form of a registration finger is utilized for resetting a complete machine timing cycle for processing operation. This cycle, called pitch is applied to the belt and comprises a predetermined number of electrical pulses some of which control machine events.

3,790,271

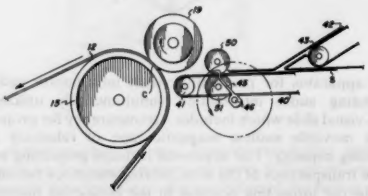
PROCESSING CONTROL SYSTEM FOR PRINTING MACHINES

James M. Donohue, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1972, Ser. No. 284,835

Int. Cl. G03g *15/00*

U.S. Cl. 355—14 **3 Claims**



A processing control system for controlling one or more processing steps of an electrostatic printing machine of the type employing an endless photoreceptor belt and a drive motor for imparting processing movement to the belt. A pho-

toreceptor motion sensitive element in the form of a rotatable member mounted on the drive shaft of the drive motor and a magnetic pickup device arranged to be actuated when aligned with each tooth of the gear serve to generate a plurality of control pulses. Series of these pulses, called pitch, are established by a reset arrangement, and are associated with the movement of the belt. Each series comprises a predetermined number of discrete electrical pulses some of which control machine events and processing steps.

3,790,272

COPYING APPARATUS

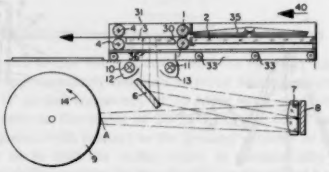
Wilhelm Knechtel, Biebertal; Gerhard Petersdorf, Pohlheim, and Winfried Sandner, Rechtenbach, all of Germany, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 13, 1972, Ser. No. 271,514

Claims priority, application Germany, July 19, 1971, P 21 35 979.5

Int. Cl. G03b *27/48, 27/50, 27/70*

U.S. Cl. 355—51 **12 Claims**



This specification discloses improvements in a copying apparatus of the type wherein sheet originals or thicker books may be selectively moved along a copying window and wherein a conventional transport mechanism for sheet originals is connected to a transparent book support positioned on an extension of the transport mechanism, said transport mechanism for sheet originals and said book supporting being selectively moved in common. The improvements consist in a fully automatic drive mechanism for moving the book support and the transport mechanism. The drive mechanism is arranged to impart preferably one reciprocal movement to the book support and the transport mechanism for sheet originals.

3,790,273

ELECTROPHOTOGRAPHIC DUPLICATOR OF THE TRANSFER TYPE

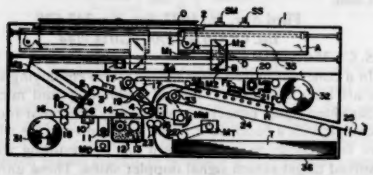
Susumu Tanaka, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

Filed Dec. 29, 1971, Ser. No. 213,308

Claims priority, application Japan, Dec. 30, 1970, 45/126791

Int. Cl. G03g *5/02*

U.S. Cl. 355—16 **4 Claims**



In an electrophotographic duplicator of the transfer type an image projected onto a photosensitive surface is transferred onto the surface of a transparent dielectric film superposed with respect to the photosensitive surface. The transfer is accomplished by an AC corona discharge and a uniform irradiation of the superposed dielectric film and photosensitive surface to stabilize the image. Subsequently, a transfer paper and the transparent dielectric film are superposed and the image transferred to the transfer paper by application of a toner and a corona discharge of the opposite polarity of the toner. The image on the transfer paper is then fixed by heating.

3,790,274

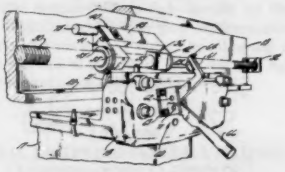
CARRIAGE ADJUSTING MECHANISM FOR CAMERA

Charles W. Smoot, Skokie, and Arvids Saldenais, Palatine, both of Ill., assignors to Apeco Corporation, Evanston, Ill.

Filed Mar. 16, 1973, Ser. No. 341,995

Int. Cl. G03b *27/52*

U.S. Cl. 355—55 **8 Claims**



An adjusting mechanism for a camera used for exposing photographic plates and the like having a frame for the slidable mounting of a lens carriage and a copy board carriage. Power operated feed screws are captively journaled on the frame. The feed screws have respective traveling nuts permanently threaded thereon. Each nut has a keyed connection with the associated carriage. Each feed screw is calibrated in terms of carriage position. The yoke is swingable away from the carriage to break the keyed connection to permit rapid manual sliding of the carriage to a new position and swingable toward the carriage for subsequent engagement of the keyed connection for normal operation of the screw and with automatic reestablishing of the calibration. A clamp including a toggle is provided for clamping the yoke tightly to the carriage during normal operation of the feed screw. An interlock switch is provided to enable driving of the feed screw only when the yoke is firmly clamped in seated position.

3,790,275

METHOD AND APPARATUS FOR SENSING RADIATION DERIVED FROM INFORMATION BEARING MEDIA

Robert W. Huboi, Webster; Osmond F. Palmer, Rochester, and Edward M. Waz, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

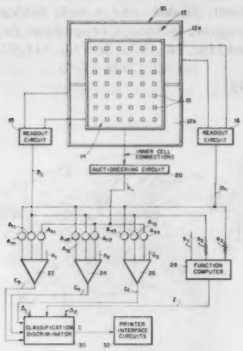
Continuation-in-part of Ser. No. 67,331, Aug. 27, 1970, abandoned. This application Mar. 24, 1972, Ser. No. 237,940

Int. Cl. G03b *27/76*

U.S. Cl. 355—68 **9 Claims**

Method and apparatus for sensing radiation derived from an image or scene on information bearing media or originals so that the original, which may take the form of a negative or positive, may be appropriately classified and be printed (or reproduced) onto a record media or photosensitive copy material. In an illustrative embodiment of this invention, the apparatus includes a radiation sensitive assembly having a first radiation sensitive element for sensing the peripheral portion of the original and a second radiation sensitive element responsive to radiation derived from the subject or centrally disposed portion of the original. Further, the peripheral or first element includes a first radiation sensitive device for receiving radiation from a first or upper portion of the peripheral portion corresponding to the background of the

scene on the original and a second radiation sensitive device for sensing radiation derived from a corresponding second or lower foreground portion of the scene on the original. First and second signals are developed by the first and second radiation sensitive devices, respectively. The second radiation sensitive element includes a plurality of radiation sensitive devices each responsive to radiation derived from a discrete sub-portion of the subject or centrally disposed portion of the original to produce a corresponding plurality of third signals. The plurality of third signals derived from the second radiation sensitive element are applied to an auctioneering circuit



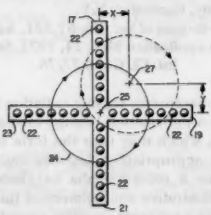
for providing a selected third signal indicative of that discrete sub-portion of the centrally disposed or subject portion on having the highest density. The first, second and selected third signals are applied to apparatus for producing first, second and third classification signals indicative of backlighted, normal or frontlighted scenes. The first and second signals are also applied to apparatus for deriving an exposure control signal corresponding to one of the first, second and third classification signals in accordance with the characteristics of the first and second signals. The original is reproduced under the control of the selected exposure control signal.

3,790,276

DIRECT MEASUREMENT OF SHIP BODY DISTORTION USING A LASER BEAM

George W. Cook, McLean, Va., and David T. Milne, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 7, 1971, Ser. No. 131,969
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **4 Claims**



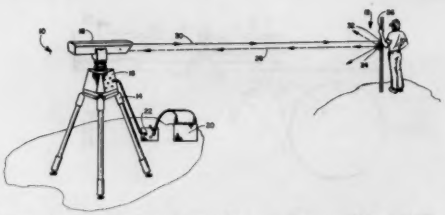
A laser light beam is directed to a cruciform target containing a series array of photo detectors on each arm. The light beam is perpendicular to the cruciform and is orbited about the cruciform center. A differential pulse width modulated (DPWM) wave is generated by the signals emitted from the photo detectors each time they are illuminated by the light beam, as the output of the photo detectors are connected to bi-stable flip-flops which are triggered into positive and negative states and whose pulse width depends upon the time for the rotating laser beam to travel between two arms displaced from each other by a 180° of arc. Angular distortions in the X axis and the Y axis are separately measured by two pairs of arms, the arms of each pair being displaced 180° from each other. The width of the pulse is proportional to the angular distortion.

3,790,277

OPTICAL INSTRUMENT TRACKING SYSTEM

William M. Hogan, North Little Rock, Ark., assignor to Blount & George, Inc., Jacksonville, Ark.

Filed Sept. 20, 1971, Ser. No. 181,839
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **10 Claims**



The specification discloses an automated optical instrument system which includes a support pedestal rotatably supporting a housing on the upper end thereof. The housing includes a laser for directing a collimated beam of light for use in surveying and also includes an infrared detector system mounted therein. A portable beacon which emits infrared waves is adapted to be attached to a surveying stadia rod or to earth moving equipment or the like. The infrared detector system detects the position of the beacon and operates a motor to pivot the housing such that the laser beam is continuously maintained in alignment with the stadia rod. In case the path between the beacon and the infrared detector system is interrupted, circuitry is provided to continuously cycle the housing until the beacon is again sensed by the infrared detector system.

3,790,278

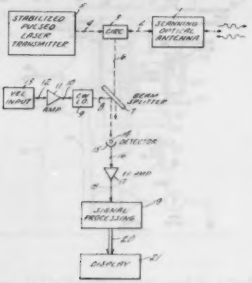
PEAKED POWER COHERENT PULSED LASER TRANSMITTER/RECEIVER SYSTEM

Carl J. Buczek, Manchester; Michael L. Skolnick, West Hartford, and Gary E. Gurski, Manchester, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 26, 1972, Ser. No. 247,678
Int. Cl. G01c *23/00*; G01s *9/44*
U.S. Cl. 356—28 **1 Claim**

In a coherent pulsed laser radar system employing state-of-the-art laser technology, optical technology and microwave radar video signal processing technology, the radar receiver is provided with a bandwidth which is commensurate with doppler frequencies in radar return signals resulting from unresolved target return signal doppler shifts. These unresolved doppler shifts are on the order of magnitude of those resulting from targets having ground speeds on the order of tens of miles per hour. The above said bandwidth being orders of magnitude larger than that required for the data rate of return signals. The pulsewidth of the transmitter is designed to be matched (substantially the reciprocal) to the aforementioned

large bandwidth, whose function is determined by the shape of the transmitted pulse. The PRF is chosen to be the lowest possible commensurate with the data rate. In one embodiment, a 10.6 micron carbon dioxide laser transmitter is passively Q-switched by a low pressure gas saturable absorber, such as a sulfer hexafluoride cell, giving an output pulse having a pulsewidth on the order of roughly one tenth



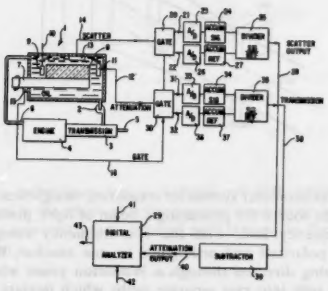
microsecond to one microsecond, and the receiver has bandwidth of approximately one half to three MHz, operating at a nominal IF center frequency of 30 MHz, with receiver information rates on the order of 20-50 KHz, the local oscillator being adjusted with respect to the ground velocity of the laser radar so as to provide radar video at substantially the IF frequency falling within the bandwidth, as described hereinbefore.

3,790,279

OIL CONTAMINATION MONITOR WITH DIGITAL SIGNAL PROCESSING

George Frank Skala, Scotia, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Filed Sept. 28, 1971, Ser. No. 184,477
Int. Cl. G01n *33/28, 21/26*
U.S. Cl. 356—70 **17 Claims**



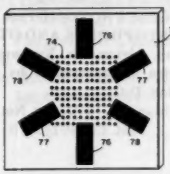
The circuit for digitally processing the analog signals from an oil contamination monitor includes analog to digital converters, digital accumulators for accumulating the thus converted signals over a predetermined period of time and digital comparators, preferably dividers for forming ratios of the thus accumulated digital signals to produce a comparison output. When a single analog signal corresponding to the light scattering effect a reference material and the oil to be monitored have upon light is to be processed, gate means first separates the analog signal corresponding to only the light scattering effect of the oil and a second analog signal corresponding only to the light scattering effect of the reference material; and when a single analog electrical signal corresponding to the light attenuation effect the reference material and oil have upon light is to be processed, gate means separates the single signal into a first analog signal corresponding only to the light attenuation effect of the oil and a second analog signal corresponding only to the light attenuation affect of the reference material. Each of the thus separated analog signals is processed by an analog to digital converter whose output is accumulated over a predetermined period of time and fed to a respective one of two digital dividers, with the first digital having an output corresponding to the ratio of the light scattering effect of the oil and the light scattering effect of the reference, and the second digital divider having an output corresponding to the light transmission effect of the oil and the light transmission effect of the reference material. The ratio output of the first digital divider is fed directly to the digital analyzer while the ratio output of the second digital divider, corresponding to light transmission, is first fed to a digital subtractor where it is subtracted from a predetermined higher digital standard corresponding to complete light transmission so as to produce an attenuation ratio output that is fed directly to the digital analyzer. The digital analyzer may give representative values to the amount of contamination within the oil or the chemical breakdown or the like of the oil, or have warning lights as to excessive contamination or oil breakdown.

3,790,280

SPATIAL FILTERING SYSTEM UTILIZING COMPENSATING ELEMENTS

Robert Alfred Heinz, Flemington Twp., Hunterdon County, and Robert Charles Oehrle, Edgewater Park Twp., Burlington County, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed May 3, 1972, Ser. No. 249,984
Int. Cl. G01n *21/32*; **G02b** *27/38*
U.S. Cl. 356—71 **18 Claims**



A spatial filtering system for inspecting integrated circuit photomasks, and the like. The system includes a spatial filter comprising a matrix-like array of opaque regions on a transparent field, as well as one pair of opaque compensating elements for each element edge orientation in the photomask to be inspected. The opaque regions block the d.c. and lower spatial frequencies of the periodic photomask feature information, while the compensating elements block the corresponding higher spatial frequencies (i.e., the edge information). Use of the system significantly improves the signal-to-noise ratio of the filtered image.

3,790,281

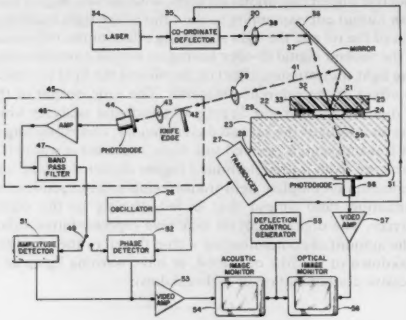
COMBINED SYSTEM FOR ACOUSTICAL-OPTICAL MICROSCOPY

Lawrence W. Kessler, Glenview, and Adrianus Korpel, Prospect Heights, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 26, 1973, Ser. No. 335,854
Int. Cl. H04b *11/00*
U.S. Cl. 356—72 **15 Claims**

A combined acoustical-optical inspection system, operating at microscopic levels, in which an object to be studied is im-

mersed in water or other sonic fluid propagation medium in close proximity to a partially-metallized semi-reflective mirror formed on an elastically deformable interface surface of a faceplate that engages the sonic propagation medium. The object is insonified with high-frequency acoustic energy, preferably at 100 MHz or more, from the side opposite the interface surface, producing a ripple pattern on the interface



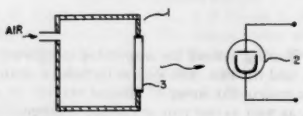
surface representative of the acoustic properties of the object. The object is scanned with a laser beam, through the interface; a reflected fraction of the beam is utilized to develop an acoustic image of the object and a transmitted fraction of the beam is employed to develop a precisely correlated optical image of the object. The two images may be superimposed for interpretation purposes.

3,790,282

FLAME-IN-ENGINE PHOTOMETER DETECTOR AND ALARM FOR PHOSPHORUS AND OTHER ELEMENTS

George H. Fielding, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 23, 1972, Ser. No. 237,428
Int. Cl. G01j *3/30*
U.S. Cl. 356—86 **8 Claims**



An apparatus and method for determining the concentration of pollutants in air by exciting atoms of the pollutant in a pressure chamber and measuring the intensity of the characteristic light emitted by the excited atoms.

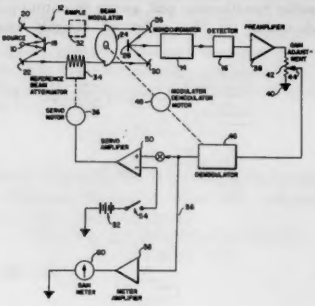
3,790,283

TOTAL LOOP GAIN INDICATOR FOR OPTICAL NULL SPECTROPHOTOMETER

Allan S. Way, Irvine, and William J. Hayman, Fullerton, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 31, 1973, Ser. No. 328,477
Int. Cl. G01j *3/42*
U.S. Cl. 356—89 **4 Claims**

An optical null spectrophotometer having means for setting up the instrument gain for optimum response prior to insertion of a sample in the sample beam, the means including a voltage source to provide an unbalancing voltage to close the reference beam attenuator, a gain adjustment potentiometer



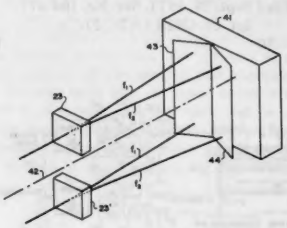
in the detector output circuit and a visual readout device for indicating optimum gain with the reference beam attenuator in a closed position.

3,790,284

INTERFEROMETER SYSTEM FOR MEASURING STRAIGHTNESS AND ROLL

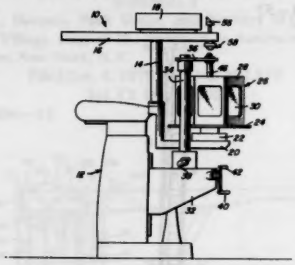
Richard R. Baldwin, Saratoga, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 8, 1972, Ser. No. 250,903
Int. Cl. G01b *9/02*
U.S. Cl. 356—106 **9 Claims**



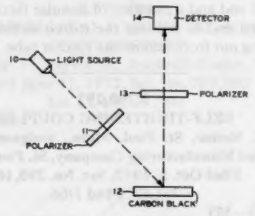
An interferometer system for measuring straightness including a light source for producing a beam of light, preferably a two frequency laser with the two frequency components linearly polarized and orthogonal to one another, the light beam being directed through a Wollaston prism where the beam is split into two separate paths which deviate, in opposite paths, from the original beam direction by a small angle. The two separate beams are transmitted over two separate paths to associated ones of two separate reflective surfaces which are mounted in a mutually fixed relationship and at an angle to each other. The two beams are reflected back into the prism from the associated reflective surfaces where they are recombined. Photodetector means are provided for detecting any changes in the fringes resulting from a change in one optical path length relative to other optical path length as the two mirrors move relative to the prism, said change in path lengths resulting from deviations from straightness in such movement. A dual system is disclosed for measuring rotational motion, i.e., roll.

3,790,285
SCATTERED LIGHT POLARISCOPE
Weldon F. Swinson, Auburn, Ala., assignor to Harmon White & Associates, Inc., Opelika, Ala.
Filed July 19, 1971, Ser. No. 163,744
Int. Cl. G01r *21/40*
U.S. Cl. 356—115 **10 Claims**



A photoelastic model is fixedly positioned in a body of fluid within an octagonal tank. The planar sides of the tank are provided with windows and the tank is supported for angular movement about a vertical axis relative to the model until desired fringe patterns are visible through one or more of the windows. Laser or polarized light beams scattered or transmitted by the model produce the fringe patterns for analysis of the model under different operational modes.

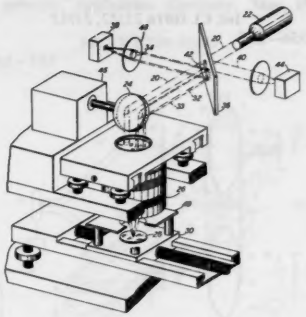
3,790,286
CARBON BLACK TESTING BY ANALYZING NON-SPECULARLY REFLECTED POLARIZED LIGHT
Gerhard Kraus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Washington, D.C.
Filed Apr. 21, 1972, Ser. No. 246,329
Int. Cl. G01n *21/48*
U.S. Cl. 356—118 **1 Claim**



A dry reflectance test is carried out with incident light polarized in the plane of reflection and an analyzer is inserted into the remitted beam, crossed with respect to the incident radiation.

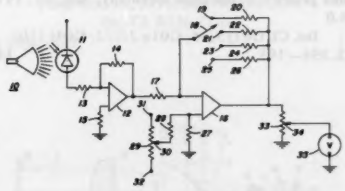
3,790,287
SURFACE INSPECTION WITH SCANNED FOCUSED LIGHT BEAMS
John David Cuthbert, Bethlehem; Richard George McMahon, Allentown, and David Farnham Munro, Wescoesville, all of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y., by said McMahon and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., by said Cuthbert and Munro
Filed Mar. 31, 1972, Ser. No. 239,900
Int. Cl. G01n *21/16*
U.S. Cl. 356—120 **17 Claims**

A surface inspection system uses a highly focused spot of light moved rapidly over the surface to perform an inspection. This permits a ready location of the defects, gives some indication as to their size, and permits a high resolution inspection to be performed in a relatively short time. An optical arrangement is employed in which a scanned beam is brought back



through the same lens system used in generating the scan to produce an immobilized return signal beam. A stop or spatial filter is used on the return beam to permit only the light scattered from defects to reach a detector.

3,790,288
PHOTOMETER INCLUDING VARIABLE AMPLIFICATION AND DARK CURRENT COMPENSATION
Joseph A. Hostetter, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 22, 1971, Ser. No. 210,966
Int. Cl. G01j *1/44*
U.S. Cl. 356—226 **6 Claims**



Apparatus for measuring the illumination from a source of light is disclosed in accordance with the teachings of the present invention wherein a photodiode exhibiting a substantially uniform spectral sensitivity within a defined range generates a current proportional to the intensity of illumination thereon. Operational amplifier means including a first operational amplifier having a constant closed loop amplification factor connected in series relationship with a second operational amplifier exhibiting a selectively variable closed loop amplification factor amplifies the current generated by said photodiode to provide a voltage that is proportional to the intensity of the illumination of said photodiode. Indicating means may be coupled to said operational amplifier means to provide an indication of the intensity of said illumination.

3,790,289

GAS TURBIDITY MEASURING APPARATUS

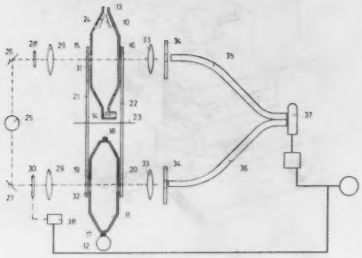
Ulrich Schmidt, Bad Homburg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 5, 1973, Ser. No. 329,381

Claims priority, application Germany, Mar. 8, 1972, P 22 11 073.2

Int. Cl. G01n *21/22, 21/12*

U.S. Cl. 356—205 29 Claims



The turbidity of exhaust gases of an internal combustion engine is measured by comparing light transmission through the gases with light transmission through an equivalent body of clean air. In order to prevent accumulation of dirt or soot on the light source, photocell, and optical path element, a pair of transparent rotating discs is used to close off the opening through which light enters and leaves the test chamber, allowing a small gap for a laminar boundary layer of clean air. One of the discs has opaque sectors and functions also as a shutter,so that the light may pass alternately through the test chamber and through another chamber containing clean air.

3,790,290

SINGLE MODULATED LIGHT BEAM PHOTOMETER

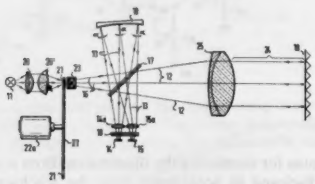
Joachim M. Muller, Pullach, and Adolf J. Triller, Munich, both of Germany, assignors to Erwin Sick Optik-Elektronik, Waldkirch, Germany

Filed Aug. 3, 1972, Ser. No. 277,615

Claims priority, application Germany, Aug. 11, 1971, P 24 40 335.0

Int. Cl. G01j *3/46*; G01n *21/22*; G01j *1/10*

U.S. Cl. 356—195 14 Claims



A photometer in which a light beam is split by a mirror into measurement and reference portions, the reference portion of the beam being reflected back through the beam splitting mirror to a photoelectric device. The measurement portion of the beam is reflected back to the beam splitting mirror from which it is reflected to the photoelectric device. The photoelectric device compares intensities of the two received beam portions and provides indication representative of transmission, extinction and remission.

3,790,291

USEFUL WRITING INSTRUMENT

Ya-Mei Hung, 52, Sec. 1, Shing N. Rd., and Yen-Ping Hsiao Liu, 33, Ln., 170 Twng. Hwa St., both of Taipei, China /Taiwan

Filed July 17, 1972, Ser. No. 272,095

Int. Cl. B43k *21/02, 21/22*

U.S. Cl. 401—57 8 Claims

A writing instrument comprises a tubular casing with a writing unit which is frictionally interfitted with the front end of the casing, and an ejector means for ejecting the writing unit from the casing as its writing point becomes blunt for replacement by a sharpened unit. Each writing unit carries a sharpened lead pencil element or the like at its front portion and includes a suddenly enlarging and gradually reducing portion at its middle portion, while its rear portion has substantially the same shape as the front section. The ejector means further comprises a tubular casing in which the remaining writing units of a plurality of writing units are stored, with an ejector at its closed end and a plurality of annular flexible projections at its opened end to prevent the stored writing units therein from slipping out from behind the ejector tube.

3,790,292

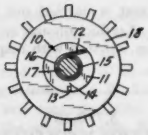
SELF-TIGHTENING COUPLER

Leonard R. Nestor, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 5, 1972, Ser. No. 295,161

Int. Cl. F16d *1/06*

U.S. Cl. 403—351 15 Claims



A radially expandable body having a cylindrical bore and longitudinally slotted to provide access thereto is coupled to a smooth shaft within said bore by tangential insertion of a thin flexible filler strip. The body may fit within a hub for coupling said hub to said shaft.

ERRATUM

For Class 403—124 see:
Patent No. 3,790,195

ERRATUM

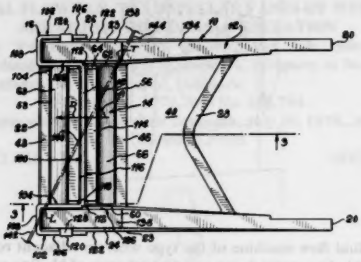
For Class 403—192 see:
Patent No. 3,790,232

3,790,293

PAVEMENT MARKER REFLECTOR MEMBER AND ASSEMBLY

Sidney A. Heenan, Park Ridge, and Norbert Majewski, Elk Grove Village, both of Ill., assignors to Amerace Esna Corporation, New York, N.Y.

Filed Oct. 4, 1972, Ser. No. 294,810
Int. Cl. E01f *11/00*
U.S. Cl. 404—15 **14 Claims**



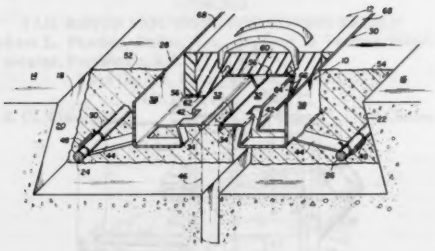
A pavement marker reflector member having a shell-like body of synthetic resin material, a filler material within the shell-like body and a base plate affixed to the shell-like body and including lowermost surface portions establishing a basal support for the reflector member. The reflector member may be affixed to a base member, in which case the lowermost surface portions of the base plate engage corresponding portions of the base member in a pavement marker assembly.

3,790,294

ELASTOMERIC SEAL POSITIONING SUPPORT CONSTRUCTION

Mario R. Trieste, 37, Variek Ct., Rockville Centre, N.Y.

Filed June 12, 1972, Ser. No. 261,902
Int. Cl. E01c *11/04*
U.S. Cl. 404—68 **4 Claims**



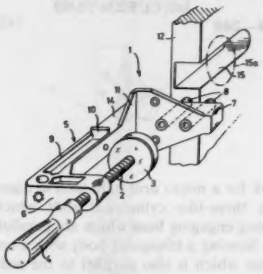
A mounting support for a shaped elastomeric seal for a roadway or the like, wherein the support is readily mounted in a clearance position within the roadway expansion joint or void and cement is poured in situ about said support preparatory to the positioning of the elastomeric seal thereon. Eliminated are pre-cast cement blocks and the like which heretofore complicated field installation of the elastomeric seal.

3,790,295

BORING DEVICE FOR SECURING HINGES AND THE LIKE

Hellmuth Grunert, Hoffnungsthal, Germany, assignor to Prameta Prazisionsmetall-und Kunststafferzeugnisse G. Baumann & Co., Cologne, Germany

Filed May 12, 1972, Ser. No. 252,801
Claims priority, application Germany, May 18, 1971, 7119369
Int. Cl. B23b *49/00*
U.S. Cl. 408—103 **7 Claims**



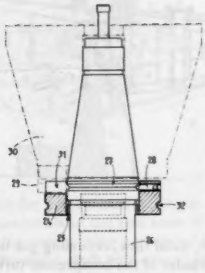
A boring device for use in positioning and fastening hinge members between a door and frame member where the door panel has a mounting recess for receiving at least a part of the hinge. The device includes a screw clamp adapted to be positioned around an outer edge of the frame and guides for boring mounting holes in the frame. The clamp is provided with interchangeable U-shaped adaptor pieces for insertion within the mounting recess of the door panel. Various adaptor pieces for circular and elongated recesses of various sizes are provided to permit universal application of the boring device.

3,790,296

DEVICE FOR THE DRIVING OF A TOOL BY MEANS OF THE SPINDLE OF A MACHINE-TOOL

Andre Mottu, and Arnold Heimann, both of Geneva, Switzerland, assignors to Societe Genevoise D'Instruments De Physique, Geneva, Switzerland

Filed Oct. 12, 1971, Ser. No. 188,214
Int. Cl. B23b *31/04*
U.S. Cl. 408—239 **1 Claim**



Device for the driving of a tool by means of the spindle of a machine-tool in which one of the two elements — spindle-tip of the machine and tool — is provided with at least one axial lug engaging in a matched groove of the other element so as to ensure the driving of the tool by means of the spindle independently of the friction drive which exists between the taper of

the tool and the tapered bore of the spindle, characterized by the fact that one of the elements — spindle-nose and tool — carries a part set up onto it so as to be angularly adjustable, this part being provided with said lug or groove, the whole being so arranged that the angular position of the spindle relative to the tool is adjustable when the latter is set up into the spindle and when said lug fits into said groove.

3,790,297

MICRO DRILL AND METHOD OF CONSTRUCTION

Ethan K. Maursey, 2123 Common Rd., Warren, Mich.

Filed Oct. 25, 1972, Ser. No. 300,713
Int. Cl. B23b *51/02*
U.S. Cl. 408—240 **7 Claims**

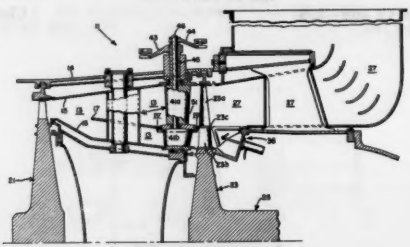
The shank for a micro drill 0.06 inch in diameter or less is made from three-like cylindrical rods which are brazed together along engaging lines which are parallel to the center of the rods forming a triangular body with a central aperture therebetween which is also parallel to the rod centers. One end of the joined rods has a drill advanced into the aperture for drilling a hole therein for the driven end of the micro drill. The end may be supported within the drilled aperture by suitable adhesive such as an epoxy, a low temperature solder or the like so that the drill end can readily be removed in case of breakage for replacement without affecting the securement of the three rod sections together with the higher temperature brazing material.

3,790,298

FLEXIBLE CONTOUR TURBINE NOZZLE FOR TIGHT CLOSURE

Robert L. Hendrickson, Scotia, and George W. Scheper, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 1, 1972, Ser. No. 249,614
Int. Cl. F01d *1/30;* **F02c** *1/06*
U.S. Cl. 415—152 **9 Claims**



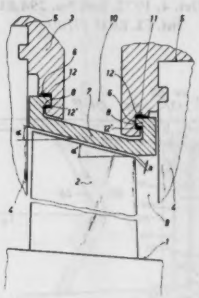
In a two shaft, axial flow, reversing gas turbine, hot turbine gases from the blades of the compressor turbine are selectively directed through a variable nozzle ring to rotate the turbine wheel of the load shaft in either one or the other direction. The variable nozzle ring comprises two concentric rings of adjustable vanes, one of which may be open while the other is closed. The present invention is directed toward controlling leakage losses through the vanes when closed and also toward limiting turbulence and hence aerodynamic losses in the vanes when open.

3,790,299

APPARATUS FOR ADJUSTING TIP CLEARANCE IN FLUID FLOW MACHINES

Erwin Sidler, Baden, Switzerland, assignor to Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 17, 1972, Ser. No. 298,235
Claims priority, application Switzerland, Nov. 10, 1971, 16255/71
Int. Cl. F01d *1/10, 9/02*
U.S. Cl. 415—199 R **2 Claims**



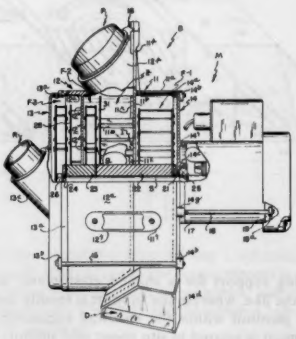
A fluid flow machine of the type wherein adjacent rows of rotor blading rotate between adjacent rows of blading carried by the stator and wherein a ring formed from arcuate intermediate pieces fitted to the stator blading carrier intermediate adjacent rows of stator blading functions as a heat storage member and also forms a space separate from the flow passage for cooling stator blading carrier. The inner periphery of the ring of intermediate pieces establishes a running clearance with the tips of the rotor blading and this clearance is made adjustable by the insertion of packing strips between key portions formed on the intermediate pieces and the walls of circular grooves formed in the stator blading carrier in which these key portions are secured.

3,790,300

MULTI-FUNCTION CENTRIFUGAL BLOWER UNIT

Michael L. Gilliland, Kent, Ohio, assignor to Ametek, Inc., New York, N.Y.

Filed May 18, 1972, Ser. No. 254,760
Int. Cl. F01d *1/02, 25/24, 9/00*
U.S. Cl. 415—219 C **10 Claims**



A two-stage centrifugal fan section with a first suction inlet, a central diffuser chamber section accepting the first section

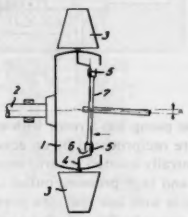
discharge and having circumferentially spaced second and third suction inlets, and a final generally tangentially discharging centrifugal fan section receiving diffuser section discharge, all incorporated in a composite housing to form a motor-blower unit with an induction motor section of which the fan mounting rotor shaft is supported in a housing end wall offset from the housing axis to provide with a local pinch formation in the final section interior, a scroll or snail shell type discharge. The diffuser section is vaned to isolate and allocate certain flows to respective regions of the final fan inlet and thereby promote stable pumping operation at the three inlets independently at distinct flow and/or pressure differential conditions.

3,790,301

AXIAL FLOW FAN, THE IMPELLER VANES OF WHICH ARE ADJUSTABLE DURING OPERATION

Henry Valdemar Pedersen, Haslev, and Ole Jakobsen Bredsted, Naestved, both of Denmark, assignors to Nordisk Ventilator Co. A/S, Nestved, Denmark

Filed July 1, 1971, Ser. No. 158,794
Claims priority, application Denmark, July 10, 1970, 3610
Int. Cl. F04d *29/36*
U.S. Cl. 416—108 **10 Claims**



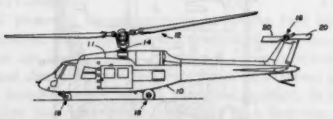
An axial flow fan comprising a plurality of impeller vanes that are angularly adjustable during operation by means of an adjustment member operatively connected with the vanes and having an axis that either forms a small angle with the axis of rotation of the impeller or has a small transverse distance therefrom. The adjustment member may be axially or angularly displaceable for causing the desired vane adjustment in such a way that during each revolution of the impeller the vanes are successively acted upon by the adjustment member, i.e., at least one but not all of the vanes are adjusted at a time.

3,790,302

TAIL ROTOR MOUNTING FOR CONING RELIEF

Robert L. Pascher, Dallas, Tex., assignor to Textron Incorporated, Providence, R.I.

Filed Oct. 10, 1972, Ser. No. 295,888
Int. Cl. B64c *27/48*
U.S. Cl. 416—134 **19 Claims**



Helicopter tail rotors provide anti-torque forces to maintain stabilized flight and further provide aircraft heading control. Aerodynamic forces generated on the rotor blade cause the tip thereof to move out of line with the pitch change axis of the blade, an effect known as "coning," which produces undesirable forces on the rotor blade, the hub and the tail rotor control system.

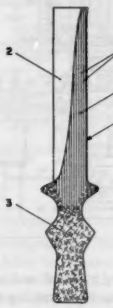
Each tail rotor blade is attached to a blade grip which is coupled to a yoke through laminated elastomeric bearings that provide in-plane stiffness while permitting blade coning in such a manner as to relieve the undesired coning effect forces.

3,790,303

GAS TURBINE BUCKET

Wilhelm Endres, Ennetbaden, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Apr. 5, 1972, Ser. No. 241,165
Claims priority, application Switzerland, Apr. 8, 1971, 5225/71
Int. Cl. F01d *5/28*
U.S. Cl. 416—241 **4 Claims**



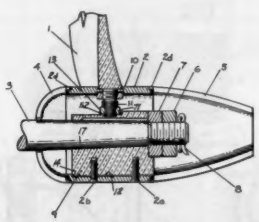
In a gas turbine bucket, having a blade and a root, composed of a eutectic alloy the blade is reinforced by eutectic fibers disposed in grain-orientated form, whilst in the root of the bucket the structure is non-orientated and enjoys a desirably high impact strength and ductility.

3,790,304

DETACHABLE PROPELLER BLADE

Joseph R. Langlois, 3331 Charleston Blvd., Ft. Lauderdale, Fla.

Filed Feb. 16, 1973, Ser. No. 333,205
Int. Cl. B63h *1/20*
U.S. Cl. 416—207 **4 Claims**



A propulsion unit for a watercraft having an annular casing to be axially positioned about the end zone of the drive shaft of the watercraft, the casing being connected to an inner hub to be secured to the drive shaft with spacer portions radially extending from the hub and connecting it to the casing; the casing and hub have means for connecting the blade to the hub, the blades each having a shank portion seated in the hub periphery and extending through a hole, the casing, with the shank of each blade being locked to the hub and casing in a predetermined pitch attitude, the lock being releasible to change the pitch of the blade or to replace it with a different type or configuration thereof.

3,790,305

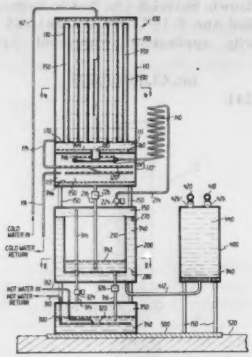
THERMAL-GRAVITY FLUID PUMPING METHOD AND APPARATUS

Albert C. Ledner, 5328 Bellaire Dr., New Orleans, La.

Continuation-in-part of Ser. No. 249,032, May 1, 1972. This application Nov. 28, 1972, Ser. No. 309,972

Int. Cl. F04b *35/02*; F03g *3/00*

U.S. Cl. 417—53 5 Claims



A large volume pumping method and apparatus comprising an economical thermal-gravity pumping system which is non-polluting, and employs relatively free and limitless, generally available, sources of energy input. The invention is particularly useful in pumping water into a tank reservoir for the ultimate purpose of generating hydroelectric power by conventional turbine-operated generator.

3,790,306

PUMPING TRAP FOR CONDENSATE

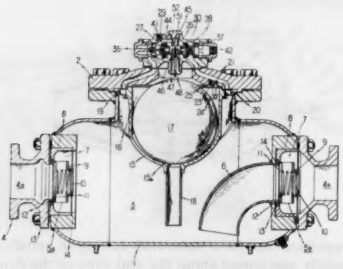
Zenichiro Uefuji, Kakogawa, Japan, assignor to Fujiwara Manufacturing Co. Ltd., Kakogawa, Japan

Filed Oct. 5, 1971, Ser. No. 186,604

Claims priority, application Japan, Oct. 13, 1970, 45-89958; Mar. 17, 1971, 46-14929; Apr. 13, 1971, 46-23355

Int. Cl. F04f *1/06*

U.S. Cl. 417—128 6 Claims



A pumping trap for returning high temperature condensate under lower presure directly to a boiler under higher pressure. This trap comprises in combination a condensate sump having an inlet and an outlet respectively provided with a check valve, supply and exhaust passages for higher pressure air, gas or the like, a float accomodated in said condensate sump, inlet and outlet check valves as well as pressure operated supply and exhaust valves provided on said passages, and a pilot valve which opens and closes according to rise and fall of said float.

3,790,307

FLOW CONTROL ARRANGEMENT FOR A PISTON PUMP

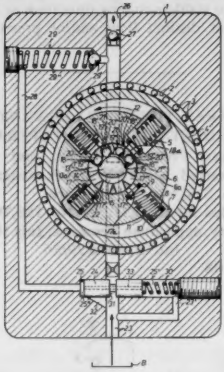
Ulrich Aldinger, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 20, 1972, Ser. No. 219,284

Claims priority, application Germany, Jan. 27, 1971, 2103645

Int. Cl. F04b *1/08*; F01b *13/06*

U.S. Cl. 417—270 8 Claims



A radial piston pump has a rotor with cylinder chambers in which pistons are reciprocated by an eccentric actuator ring. A stationary centrally located control means has low pressure inlet chambers and high pressure outlet chambers connected by radial channels with low pressure ports and high pressure ports which are swept by the cylinder ports of the pump rotor. Only in the radial channels in which high pressure prevails, check valves are provided so that no high pressure fluid can flow from a high pressure outlet chamber into a cylinder chamber still filled with low pressure fluid.

3,790,308

SPRING SUSPENSION FOR MOUNTING THE MOTOR COMPRESSOR OF A REFRIGERATING MACHINE IN ITS CASE

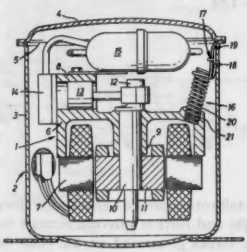
Bendt Wegge Romer, Sonderborg, and Hans Kristian Pedersen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Sept. 13, 1972, Ser. No. 288,770

Claims priority, application Germany, Sept. 14, 1971, 2145883

Int. Cl. F04b *17/02*; F16p *15/06*

U.S. Cl. 417—363 2 Claims



The invention relates to a spring suspension system for mounting a motor compressor unit of a refrigeration machine

in its case. Flanged, rectangularly shaped brackets are fixedly attached to the inner casing wall. Cooperating brackets having an L-shape with one leg having the form of a frame are attached to the flanged brackets. Each bracket set has a nesting arrangement with the rectangularly shaped leg of the fixed bracket being nested in the frame part of the other bracket. The flange of one bracket has apertures for receiving a resilient stirrup which wedgingly maintains the other bracket in its installed position. The L-shaped brackets have bores which are respectively complementary to bores provided in the motor compressor unit. Coil spring are threadedly inserted in aligned pairs of bores to provide a resilient suspension system.

3,790,309

UNITARY PUMP-MOTOR ASSEMBLY

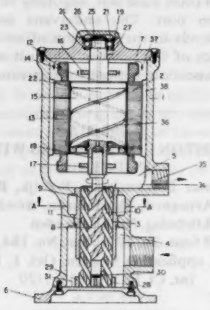
Hermann Volz, Konstanz, Germany, assignor to Allweiler AG, Radolfzell, Germany

Filed Aug. 26, 1971, Ser. No. 175,225

Claims priority, application Germany, Sept. 8, 1970, 2044295; Sept. 8, 1970, 2044335

Int. Cl. F04b *39/06*

U.S. Cl. 417—368 **13 Claims**



A housing enclosing a motor and a pump having a common drive shaft. The pump is composed of helical driving and idler elements and the motor is cooled by a secondary flow of liquid forced through the motor by helical passages, or similar arrangements, to thereafter sweep the heat generating surfaces of the motor.

3,790,310

FLUID POWERED AIR COMPRESSOR

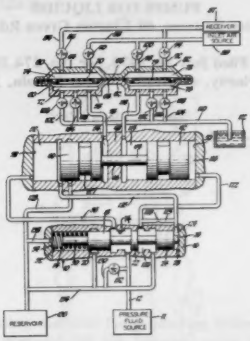
James E. Whelan, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 10, 1972, Ser. No. 252,106

Int. Cl. F04b *9/10, 35/02*

U.S. Cl. 417—388 **2 Claims**

A fluid powered air compressor including two interconnected pistons, each operatively associated with respective diaphragm air compressors. A control valve is provided to receive and direct pressurized fluid from an external source, the valve being spring biased to a normal position. In its normal position the valve directs the fluid to a first one of the pistons which moves in response thereto and pressurizes fluid flexing its associated air compressing diaphragm thereby pressurizing air that is discharged to a receiver. While the first piston is moving to pressurize air, the second piston moves to flex its associated air compressing diaphragm in a direction to draw air into its air chamber. Sufficient movement of the first piston in an air pressurizing direction opens a conduit connecting the externally supplied pressurized fluid to one end of the control valve in opposition to its spring biasing means. The control valve is moved by the pressurized fluid to a position directing the externally supplied pressurized fluid to the second piston. The second piston then moves flexing its associated air compressing diaphragm pressurizing air on the opposite side thereof which is discharged through an exhaust valve to the aforementioned receiver. At this time the first



piston flexes its air compressing diaphragm drawing inlet air into its air chamber. After the second piston has moved a sufficient distance, the pressurized fluid is exhausted from the one end of the control valve allowing it to return to its normal position completing one cycle of operation. These cycles automatically continue as long as pressurized fluid is supplied to the control valve from an external source.

3,790,311

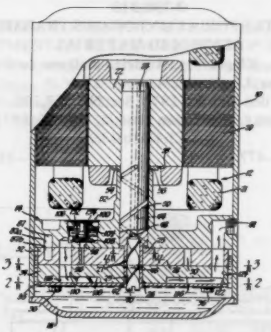
FOUR VANE ELLIPTICAL ROTARY AIR CONDITIONING COMPRESSOR

Mervin R. Butts, West Milton, and Joseph J. Robbins, West Alexandria, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1972, Ser. No. 309,789

Int. Cl. F04b *17/00*

U.S. Cl. 417—410 **3 Claims**



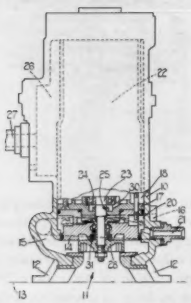
A rotary hermetically sealed refrigerant electric compressor having an elliptically shaped compression chamber in which a symmetrical rotating rotor, keyed on the drive shaft in an axially slidable manner, includes opposed pairs of sliding vanes providing an inherently balanced bearing loading. The shear forces caused by the compressor rotor revolving against the lower bearing plate are reduced by incorporating a thrust element between the electric motor rotor and stationary hub por-

tion of the upper bearing plate allowing limited movement of the compressor rotor on the shaft in an axial direction to provide for out of squareness dimensional tolerances between the compressor rotor, the shaft and the compression chamber.

3,790,312
PUMPS FOR LIQUIDS

Harry Simister Bottoms, 40 Kineton Green Rd., Solihull, England

Filed July 24, 1972, Ser. No. 274,295
Claims priority, application Great Britain, July 23, 1971, 34,551/71
Int. Cl. F04b *17/00*
U.S. Cl. 417—424 **3 Claims**

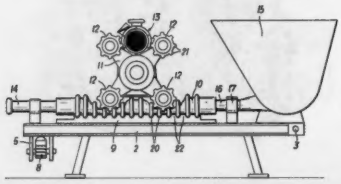


A pump for a liquid comprises a housing a first chamber in the housing, an inlet and an outlet for said front chamber a second chamber in the housing sealingly separated from the first chamber, an electric motor in the second chamber, a third chamber between the first and second chambers, an outlet from said third chamber, a main impeller in the first chamber, an anusiliary impeller in the third chamber to urge any fluid leaking from said first and second chamber to the outlet.

3,790,313
APPARATUS FOR A CONTINUOUS TRANSFER OF SEMISOLID MATERIAL

Otto Magerle, Klagenfurt, Austria, assignor to Fa. Tukiem Trust, Vaduz, Liechtenstein

Filed May 21, 1973, Ser. No. 362,235
Claims priority, application Austria, May 25, 1972, 4545/72
Int. Cl. F04b *43/12*
U.S. Cl. 417—477 **5 Claims**

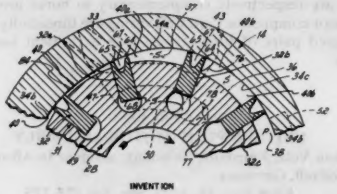


A rocker which consists of a frame is pivoted on a support on a pivotal axis and carries a straight-line bed, which supports an elastic squeeze tube. A driven spider is mounted for rotation about an axis of rotation which is parallel to said pivotal axis. Squeeze rollers are rotatably mounted on said spider and revolvable thereby about said axis of rotation and adapted to act on and compress said squeeze tube. Spring means are provided which urge said frame towards said squeeze rollers.

3,790,314
VANE PUMP HAVING EXTENDED UNDERVANE SUCTION PORTS

James C. Swain, and Cecil E. Adams, both of Columbus, Ohio, assignors to Abex Corporation, Columbus, Ohio

Filed May 22, 1972, Ser. No. 255,580
Int. Cl. F04c *15/02*
U.S. Cl. 418—1 **11 Claims**

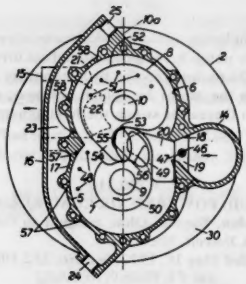


Improved high speed operation of vane pumps is obtained by the provision of undervane suction ports that are positioned to establish continuing fluid communication with the inner end of each rotor vane slot, angularly beyond the end of the main suction port. The undervane suction port advantageously extends in the direction of rotor rotation to a position just short of the point at which it would provide a short circuit connection between the pressure and suction zones.

3,790,315
ROTARY PISTON COMPRESSORS WITH LIQUID INJECTION

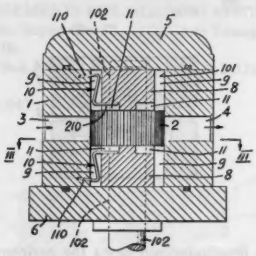
Kaj Bengt Ingemar Emanuelsson, Wilrijk, Belgium, and Bo Olof Roland Arnegård, Skarholmen, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sept. 28, 1971, Ser. No. 184,520
Claims priority, application Sweden, Oct. 1, 1970, 13310/70
Int. Cl. F01c *21/06, 1/20*
U.S. Cl. 418—97 **4 Claims**



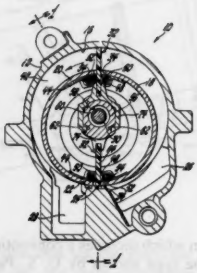
A rotary piston compressor having a casing with two intersecting parallel cylindrical bores in which a main rotor and a gate rotor cooperating therewith are mounted to rotate. Each rotor has a hub with a substantially constant radius hub portion and with a tooth extending radially from said portion and with a recess for passage of the tooth of the cooperating rotor. The casing provides end walls for the bores with axial inlet and outlet ports for the working fluid. Injection nozzles or fine openings for liquid serving as sealant and for cooling the working fluid are provided in the end walls of the gate rotor bores in such position, that they are covered by the constant radius portion of the gate rotor hub at the beginning of the compression cycle and are uncovered in the recess of said hub towards the end of the compression cycle.

3,790,316
GEAR PUMP
Marco Turolla, 213, Via Toscana, Bologna, Italy
Filed Nov. 5, 1971, Ser. No. 195,928
Claims priority, application Italy, Nov. 28, 1970, 13056/70; Aug. 10, 1971, 12860/71
Int. Cl. F01c 19/08
U.S. Cl. 418—131 12 Claims



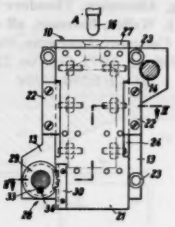
A gear pump includes at least one wear plate slidable in a bore in the pump casing towards and away from the pump gears parallel to the axes of the gears. Vacuum on the suction side of the pump draws the wear plate against the side face of the gears and a compression spring is provided to resist excessive pressure between abutting faces of the wear plate and the gears. A separate spring may be provided for each wear plate or one spring may act on two wear plates on opposite sides of the gears.

3,790,317
VANE ASSEMBLY
A. P. Stanley Hyde, and Leo F. LaFramboise, both of Saginaw, Mich., assignors to General Motors Company, Detroit, Mich.
Continuation-in-part of Ser. No. 176,836, Sept. 1, 1971, abandoned. This application Nov. 20, 1972, Ser. No. 308,138
Int. Cl. B22d 19/00; F01c 19/00, 21/00
U.S. Cl. 418—137 7 Claims



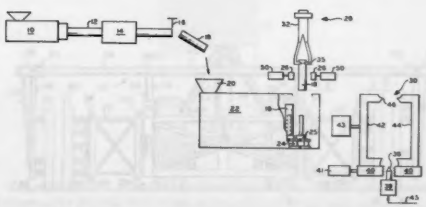
A sintered metal vane hub and a vane blade formed of an epoxy and woven glass cloth laminate are assembled by die casting magnesium or injecting plastic into recesses on the hub and blade. The vane is shown in a semi-articulated vane pump used to inject air into the exhaust system of a vehicle engine.

3,790,318
BLOW MOLDING MACHINES
Wilhelm Marfiewicz, Berlin, Germany, assignor to Firma Emil Korsch Spezialfabrik Fur Komprimiermaschinen, Berlin, Germany
Filed Apr. 10, 1972, Ser. No. 242,591
Int. Cl. B29d 23/03
U.S. Cl. 425—326 B 9 Claims



A blow molding machine for producing hollow bodies of thermoplastic material, by the blow-extrusion process, includes blow mold halves arranged inside a chase between form plates of the chase. The chase is displaceable between a receiving position, aligned with an extrusion nozzle, and a blowing position offset laterally relative to the receiving position. Vertical guides on the form plates engage guide plates on the blow mold halves for vertical displacement of the blow mold halves relative to the chase to lower the blow mold halves when the chase is moved to the blowing position. A rack and gear type lifting mechanism acts between the form plates and the blow mold halves and operates automatically, responsive to movement of the chase to the blowing position, to lower the blow mold halves. Rollers may be interposed between the guide plates and the form plates to facilitate relative movement. The blow mold halves may be closed by the usual cylinder and piston arrangements, but preferably are closed by a toggle mechanism which moves the two blow mold halves toward each other, the blow mold halves being supported for such movement on guide rods.

3,790,319
TEXTURED FINGERS FOR PRECISE TEMPERATURE ADJUSTMENT OF PREHEATED PARISON PREFORMS
Jimmie E. Hudson, Bartlesville, Okla., and Jimmy W. Snelson, Orangeburg, N.Y., assignors to Phillips Petroleum Company, Washington, D.C.
Filed Apr. 10, 1972, Ser. No. 242,385
Int. Cl. B29d 23/03
U.S. Cl. 425—387 B 6 Claims



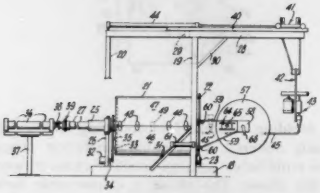
Tubular parison preforms for blow molding generally oval-shaped oriented hollow articles such as bottles are reheated to orientation temperature and the sides of the parison which are to be expanded out along a major axis of a mold are contacted

with textured fingers so as to lower the temperature a very small amount. This allows the portion of the parison corresponding to the major axis of the mold to resist stretching and thus compensates for the unequal wall thickness which otherwise results when the parison touches the walls of the mold opposite the minor axis and is thereby chilled.

3,790,320
ROTARY CASTING MACHINE

Charles D. Snelling, Allentown; Theodore E. Andrews, Kutztown, and John J. Weller, Emmaus, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 22, 1972, Ser. No. 228,130
Int. Cl. B29d *27/04*
U.S. Cl. 425—4 R **38 Claims**

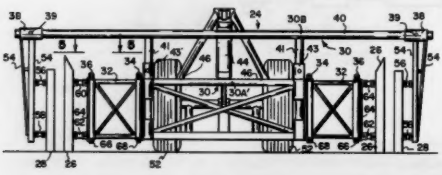


The invention contemplates a machine and method whereby rotation of an annular mold is used to develop a homogenous longitudinal and radial distribution of foaming plastic. The foaming plastic is introduced into the mold cavity during mold rotation and, particularly where mold-cavity length substantially exceeds mold-cavity diameter, a longitudinal traverse is imparted to the introduction of foaming material during rotation of the mold. The cavity is closed to permit foamed filling of the mold, and a polymerizing cure is effected prior to mold opening and product removal. The particular machine herein described is notable (a) for its ready mechanical release from both inner and outer molding contact with the product, (b) for its inherent adaptability to production of a selected one of a plurality of inner and outer profiles and sizes in the product, and (c) for its safe accommodation of fast-foaming and curing plastics, even for relatively large product diameter or girth.

3,790,321
PORTABLE SELF-ALIGNING WALL FORMING APPARATUS

Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz.

Filed Mar. 13, 1972, Ser. No. 234,245
Int. Cl. B28b *7/02*
U.S. Cl. 425—63 **8 Claims**

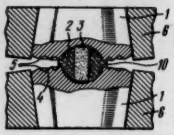


A portable self-aligning wall form connected in modular sections and provided for the casting in place of continuous monolithic type walls of a uniform height and width.

3,790,322
DEVICE FOR ESTABLISHING HIGH PRESSURE AND TEMPERATURE

Nikolai Nikolaevich Sirota, Leningradsky prospekt, 78, korpus 1a, kv. 141, Moscow; Anatoly Mitrofanovich Mazurenko, ulitsa Vostochnaya, 25, kv. 53, and Nikolai Alexeevich Strukov, Leninsky prospekt, 44, kv. 162, both of Minsk, all of U.S.S.R.

Filed July 14, 1972, Ser. No. 271,650
Int. Cl. B30b *11/32*
U.S. Cl. 425—77 **5 Claims**

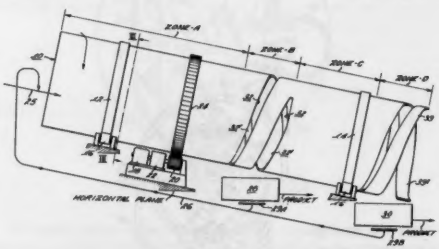


Two dies interconnected along the periphery thereof are provided on their oppositely adjacent face surfaces with center recesses and ridges, the latter being disposed coaxially in relation to said recesses. When the dies are drawn together said recesses are adapted to form a high pressure chamber in which a container made of a thermal and electrical insulating material which is ductile under omnidirectional compression is enclosed whereas the ridges are adapted to form concentric circular compartments with the clearances in the joints thereof successively increasing towards the periphery of the dies. The volumes of said compartments also increase from the center towards the periphery of the dies. These compartments are locking in their function and ensure a smooth reduction of pressure exerted by the ductile material on the face surfaces toward the periphery of the dies.

3,790,323
ROTATABLE MATERIAL HANDLING DRUM

Glenn A. Heian, Franklin, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Mar. 24, 1971, Ser. No. 127,715
Int. Cl. C09c *1/56*
U.S. Cl. 425—222 **8 Claims**



A balling drum which includes a conventional end discharge preferably of the type shown by U. S. Pat. No. 2,822,076, granted to John F. Baier on Feb. 4, 1958, and which balling drum additionally includes a discharge section intermediate the length of the drum and upstream of the end discharge section, the intermediate discharge section comprising helically extending port means in the form of helical slots through the wall of the drum which slots are so positioned with respect to the angular path of load material flow relative to the internal surface of the balling drum that some predetermined percent-

age of the entire load passing through the balling drum, preferably about 50 percent of the entire load, is discharged by the intermediate discharge section, the helical slots substantially evenly distributing the discharge flow from the intermediate discharge section onto a classifying screen positioned beneath the intermediate discharge section.

3,790,324

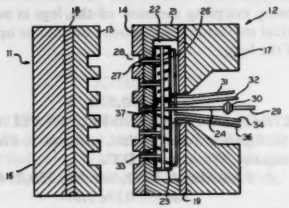
EXTENSION RUNNER SYSTEM SPRUE ARRANGEMENTS FOR MOLDING APPARATUS

Victor G. Susin, Naperville, Ill., assignor to Young Rubber Co., Naperville, Ill.

Filed June 14, 1972, Ser. No. 262,526

Int. Cl. B29h 1/06

U.S. Cl. 425—247 **9 Claims**



An extension runner system sprue arrangement for molding apparatus that includes a bushing for coupling the extension runner system to the mold cavities. The bushing is shaped and arranged to control friction generated heat of plasticized material passing through the bushing. This enables vernier control of the temperature for the material being molded and thereby enables faster and more efficient molding operations.

3,790,325

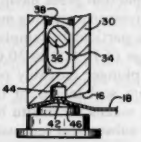
MAGNETIC TAPE TIP CUTTER

William M. Hobart, Whitinsville, and Allan C. Wainio, Maynard, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sept. 27, 1971, Ser. No. 184,087

Int. Cl. B29c 1/14

U.S. Cl. 425—299 **10 Claims**



A method and apparatus are disclosed for forming a novel magnetic tape tip for use with automatic tape threading storage devices. The magnetic tape tip is formed by cutting a half round tip in the tape and simultaneously forming a protrusion on the oxide side of the tape. The protrusion is formed in such a manner as to insure that the tape oxide surface is merely plastically deformed and not totally penetrated. The protrusion within the tape tip allows for the tip to be separated from the underlying reeled tape. This facilitates easy access of the tape tip by automatic threading devices.

3,790,326

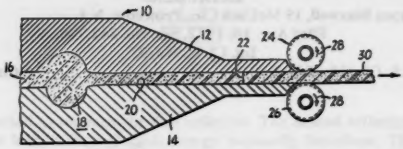
EXTRUSION APPARATUS

Ronald L. Larsen, Minneapolis, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Division of Ser. No. 47,755, June 19, 1970. This application Nov. 26, 1971, Ser. No. 202,451

Int. Cl. B29d 7/02

U.S. Cl. 425—325 **8 Claims**



An apparatus is provided for the extrusion of polymer products from a pool of molten polymer. The apparatus is comprised of at least two movable die members between which the polymer is extruded. The moveable die members apply pressure to the surface of the extruding sheet to spread and smooth out gauge variations in the extruded product to reduce the visual effects of the gauge variations on the extruded sheet.

3,790,327

APPARATUS FOR PRODUCING A THERMOPLASTICALLY DEFORMABLE PLASTIC FOIL

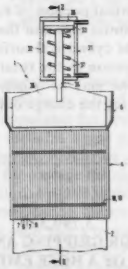
Wilhelm Haberle, D7487 Scheer/Wurtt, Industriegelande, Germany

Filed Jan. 24, 1972, Ser. No. 220,210

Claims priority, application Germany, Feb. 1, 1971, P 21 04 493.9

Int. Cl. B29f 3/06

U.S. Cl. 425—376 **11 Claims**



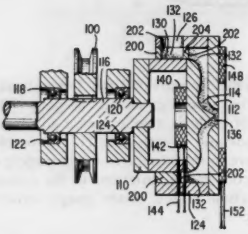
An apparatus for the production of a thermoplastically deformable plastic foil from a granulated or powdered material comprising a storage container, a block-shaped cylinder coupled to the container for receiving the material to be processed therefrom, a charging and compressing arrangement coupled between the cylinder and the storage container for conveying the material into the cylinder for compression and plastification therein, and a slot-shaped nozzle coupled to

the cylinder or formed integrally therewith for passing the material therethrough and thereby forming the plastic foil. The invention discloses also a method for making the plastic foil.

3,790,328
APPARATUS FOR FEEDING ELASTIC MELT EXTRUDERS

Bryce Maxwell, 19 McCosh Cir., Princeton, N.J.

Filed Apr. 10, 1972, Ser. No. 242,700
Int. Cl. B29f *3/02*
U.S. Cl. 425—381.2 **8 Claims**



An apparatus and method for feeding elastic melt extruders are described herein, which apparatus includes a stator and a rotor, operatively disposed with respect to the stator to define a shear zone. The stator may be formed to define an axial outlet and a radial inlet may be provided adjacent a cylindrical surface of the rotor for introducing a charge of feed material to the extruder. A guide member may be provided, adjacent the rotor, for urging the charge of feed material axially toward the shear zone in response to the operational rotation of the rotor. The guide member may be disposed so as to axially isolate the shear zone from the radial inlet.

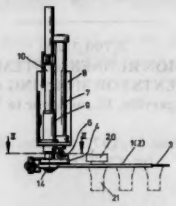
The disclosed method includes the step of providing a shear zone, defined by a stator and a rotor, operationally disposed with respect to the stator. A charge of feed material may be deposited on a cylindrical portion of the rotor, which may be aligned along a horizontal axis and the feed material may be urged axially along the cylindrical surface of the rotor toward the shear zone in response to the rotation of the rotor. Additionally, the shear zone may be axially isolated from an inlet provided for introducing the charge of feed material.

3,790,329
APPARATUS FOR GRIPPING AND SEPARATING RESPECTIVELY OF A HOSE EMERGING FROM AN EXTRUDER AND FOR ITS FEEDING INTO A DIVISIBLE BLOWING FORM BY MEANS OF A BLOWING DEVICE FOR HOLLOW BODIES

Egon Gampe, Monheim, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed Apr. 23, 1971, Ser. No. 136,759
Int. Cl. B29b *23/03*
U.S. Cl. 425—387 B **6 Claims**

An apparatus for gripping and separating a hose of synthetic material emerging from an extruder and its feeding into a divisible mold in blowing devices for hollow bodies which comprises a holding member, two legs mounted at one end thereof in the holding member, swingable in a horizontal plane and movable relative to each other. Ledges for gripping and separating, respectively, of the hose are disposed in the legs. A

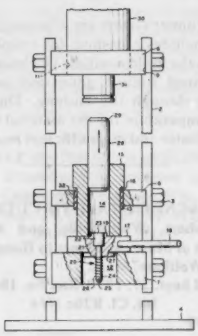


mold-closing coupling member of the legs is arranged for a symmetrical movement in opposite directions upon operation of one of the legs.

3,790,330
COMPACT PRESS AND PELLET PLUNGER

Charles H. Roland, Toledo, Ohio, assignor to Phillips Petroleum Company, Washington, D.C.

Filed May 4, 1972, Ser. No. 250,294
Int. Cl. B29c *3/00*
U.S. Cl. 425—412 **3 Claims**



A modified compaction press having a cylinder and piston mounted below a pressure providing means, wherein relatively small amounts of a particulate sample can be subjected to a pressure in the range of 15,000 to 30,000 p.s.i.; the modification comprising a plunger movably positioned in the center portion of a bottom seal means of the press cylinder. The plunger provides a means for in situ breaking of compressed pellet or pill before subsequent repressing in the same cylinder cavity.

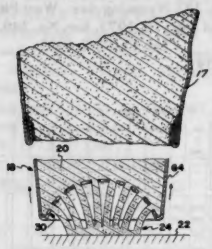
3,790,331
EXTRUDING FLOWER DESIGNS

Martin A. Backer, 434 E. South Temple, Salt Lake City, Utah

Filed June 14, 1971, Ser. No. 152,649
Int. Cl. B29f *3/04*
U.S. Cl. 425—464 **11 Claims**

There is disclosed a method and apparatus for extruding flower designs from a plastic extrudate in essentially a one step

operation. The die through which the extrudate is expressed includes means for moving the terminal ends of the petal



forming strips laterally of the axis of extrudate movement upon cessation of extrusion.

3,790,332

LIQUID CANDLES

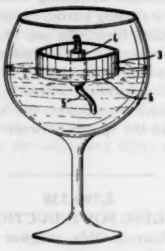
Ronald Brian Woollard, Hook, England, assignor to Price's Patent Candle Company Limited, London, England

Filed Jan. 17, 1972, Ser. No. 218,248

Claims priority, application Great Britain, Feb. 2, 1971, 3700/71

Int. Cl. F23q *2/32*

U.S. Cl. 431—126 **11 Claims**



A liquid candle capable of burning with a coloured flame is formed by floating a wick holder comprising a float and a wick on a body of combustible liquid within an open-top, for example, glass container, the liquid having a high flash point and containing in solution a flame-colouring amount of at least one flame-colouring additive. The float portion of the wick holder holds the wick with its lower part within the liquid and its upper part, which forms a burning end, spaced from the surface of the body of liquid to an extent which prevents ignition thereof during use. The liquid can contain a dye to enhance its appearance, and optionally also a perfume.

3,790,333

INFRA-RED BURNER

Piero Padovani, Donato Milanese, and Sergio Boerio, Donato Hilanese, both of Italy, assignors to Pyronics, Inc., Cleveland, Ohio

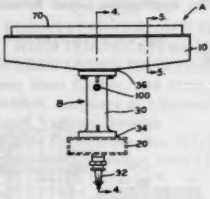
Filed Nov. 15, 1971, Ser. No. 198,681

Claims priority, application Italy, Nov. 26, 1970, 32230/70

Int. Cl. F23g *3/00*

U.S. Cl. 431—266 **9 Claims**

A gas fired infra-red generator having a first generally flat nonporous reflector and second curved nonporous reflector spaced from the flat reflector in a concave relationship therewith. A combustible fuel gas mixture is directed through elongated fissures in a plenum chamber and the first reflector to impinge and be ignited at the second reflector and then



diverted to impinge the first reflector. The heated reflectors then both radiate thermic energy outwardly therefrom. The first and second reflectors are both mounted relative to the generator so as to permit thermic dilatation during generator operation.

3,790,334

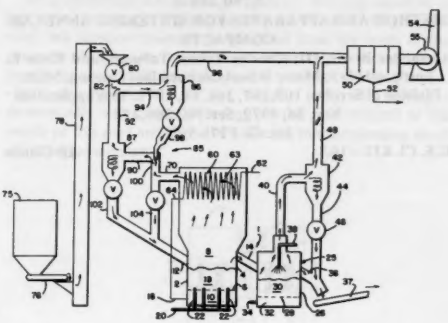
MANUFACTURE OF LIGHTWEIGHT AGGREGATE

Sidney M. Cohen, Allentown, Pa., assignor to Fuller Company, Catasauqua, Pa.

Filed May 22, 1972, Ser. No. 255,556

Int. Cl. F27b *15/00*

U.S. Cl. 432—58 **5 Claims**



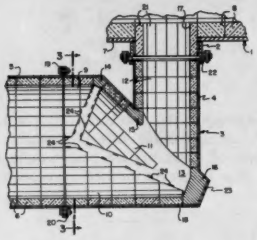
A method of and apparatus for making sealed surface fine lightweight aggregate particles in a fluid bed reactor which includes a method and apparatus for preheating the raw feed material. The reactor includes a gas permeable grid which supports a bed of material. Fluidizing air is supplied to the plenum below the grid for passage through the grid for fluidizing the particles of material in the vessel. Fuel is supplied to the fluidized bed for combustion therein to heat the material to a temperature range such that a pyroplastic surface will be formed on the surface of the particles of material and at same temperature range, gas forming components in the material will release a bloating gas. The material is then rapidly cooled. The preheater is of the suspension type and includes a plurality of serially flow connected gas-solids separators such as cyclones. Raw feed material having a particle size range up to ⅜ inch is supplied to a stream of hot gases and it is entrained in those hot gases and then separated in a cyclone. The material discharged from the one cyclone is reentrained in other hot gases and separated in a second cyclone. From the second cyclone, the material is discharged to the reactor. The original source of hot gases is the hot spent fluidizing gas from the reactor.

3,790,335

LINED COOLERS FOR ROTARY KILNS

Victor Paul Andreassen, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Apr. 7, 1972, Ser. No. 242,213
Claims priority, application Great Britain, Apr. 8, 1971, 9,077/71
Int. Cl. F27b 7/38
U.S. Cl. 432—80 7 Claims



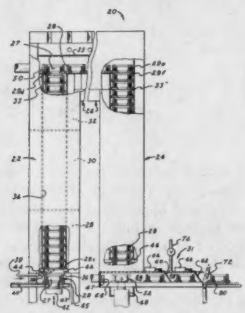
A junction piece for use in rotary kilns of the type having a plurality of planetary cooler tubes is disclosed in which the lining of the junction piece includes, at least in part, sections of monolithic material.

3,790,336

METHOD AND APPARATUS FOR SINTERING ANNULAR COMPACTS

Alexander Brede, III; Charles Robert Talmage, and Elvin E. Tuttle, all of c/o Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 105,167, Jan. 11, 1971. This application Nov. 24, 1972, Ser. No. 309,212
Int. Cl. F27b 5/02
U.S. Cl. 432—163 10 Claims



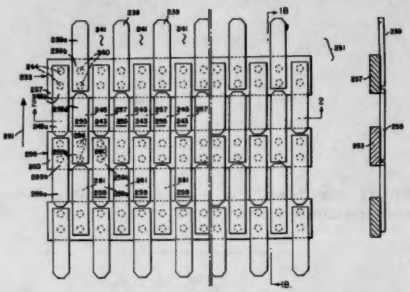
A method and apparatus for sintering annular compacts without any substantial temperature gradients through the compacts. The method involves axial movement of the compact through vertical heating and cooling towers of a controlled atmosphere furnace with lateral movement of the compact through a crossover conduit interconnecting the upper ends of the towers. The lower end of the heating tower is provided with an inlet opening in constant communication with the exterior of the furnace and the lower end of the cooling tower has an outlet connected via a sealable exit chamber with the exterior of the furnace.

3,790,337

SELF-CLEANING AIR FLOW BAR FOR APPARATUS FOR MAKING AGGREGATE

John G. Connell, 232 Wyoming Ave., West Pittston, Pa.

Filed Apr. 10, 1973, Ser. No. 349,711
Int. Cl. F27b 9/00
U.S. Cl. 432—239 10 Claims



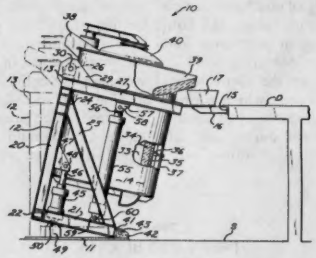
A self-cleaning air flow bar in a traveling grate assembly for conveying carbonaceous shale and the like through a furnace to make lightweight aggregate, including a series of self-cleaning air-flow bar members, with a first said bar member extending transversely across the traveling grate assembly and including a cross bar and a series of spaced key portions extending forwardly and rearwardly therefrom, a second self-cleaning air-flow bar member extending transversely across the grate assembly and including a cross bar and a series of spaced key portions extending forwardly and rearwardly therefrom, said first bar member rearwardly extending key portions positioned in the spaces between the second bar member forwardly extending key portions, whereby, when the grate assembly travels around a sprocket, the key portions of one cross bar wipe clean the spaces between the key portions of the other cross bar.

3,790,338

REAR SLAGGING FOR INDUCTION FURNACE

William J. Duca, Warren, Ohio, assignor to Ajax Magnethermic Corporation, Warren, Ohio

Filed Oct. 29, 1971, Ser. No. 193,770
Int. Cl. F27b 14/02
U.S. Cl. 432—247 6 Claims



There is disclosed herein a coreless induction furnace disposed on a vertical axis during heating and having a front pouring spout and a rear slagging spout at the upper end thereof. The furnace is mounted in a forwardly pivotable cradle carried by a backwardly tiltable base frame, the base frame being pivoted at the bottom thereof rearwardly of the furnace axis.

3,790,339

CYLINDRICAL ELONGATED FURNACE FOR TREATING MATERIAL AT HIGH TEMPERATURE IN A GASEOUS ATMOSPHERE UNDER HIGH PRESSURE

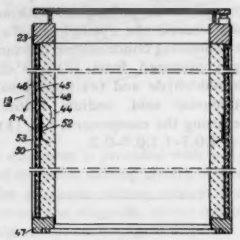
Hans Larker; Sven-Erik Isaksson; Mats Lindberg, all of Robertsfors, and Gunnar Granberg, Umea, all of Sweden, assignors to Allmanna Svenska Elekriska Aktiebolaget, Vasteras, Sweden

Filed June 5, 1973, Ser. No. 367,101

Claims priority, application Sweden, June 13, 1972, 7782/72; Dec. 29, 1972, 17130/72

Int. Cl. F27d *1/00*

U.S. Cl. 432—249 10 Claims



A cylindrical elongated furnace for treating material at high temperature in a gaseous atmosphere under high pressure is formed of a high pressure cylinder with end closures projecting into it and a furnace chamber arranged in the high pressure cylinder. The furnace chamber is insulated from the walls of the pressure chamber by a cylindrical casing having gas-impermeable tubes arranged one inside the other with an insulation between them. At least one layer of insulating material in the casing engages only the outer or inner surface of one tube and is spaced from the adjoining tube, the space between being filled with gas. The insulating material may be held against the outside of one of the tubes by rings or a spiral strip running helically.

3,790,340

CYLINDRICAL ELONGATED FURNACE FOR TREATING MATERIAL AT HIGH TEMPERATURE IN A GASEOUS ATMOSPHERE UNDER HIGH PRESSURE

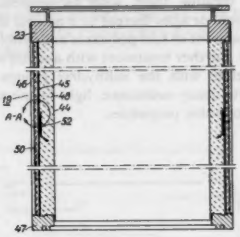
Sven-Erik Isaksson; Hans Larker, and Mats Lindberg, all of Robertsfors, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 5, 1973, Ser. No. 367,103

Claims priority, application Sweden, June 13, 1972, 727781

Int. Cl. F23m *5/00*

U.S. Cl. 432—249 7 Claims



In a cylindrical elongated furnace for treating material at high temperature in a gaseous atmosphere under high pressure, the furnace chamber is insulated from the walls of the pressure chamber by at least three tubular parts arranged one inside the other with insulating parts. At least one ring is provided attached to one of the tubular parts and having a downwardly and inwardly sloping similar part secured to the inside of this part and directed towards, but terminating short of, the opposed part.

CHEMICAL

3,790,341

METHOD OF DYEING POLYMERS CONTAINING NITRILE GROUPS AND ARTICLES MADE OF SAME

Kajum Makhkamov, ulitsa Zhdanova, 118, kv. 8; Iosif Yakubovich Kalontarov, Prospekt Kuibysheva, 4/1, kv. 15, and Eleonora Nikolaevna Repina, ulitsa Sviridenko 34, kv. 7, all of Dushanbe, U.S.S.R.

Filed Jan. 12, 1970, Ser. No. 2,353

Int. Cl. D06p *1/00, 3/82*

U.S. Cl. 8—52 **12 Claims**

A method of dyeing polymers containing nitrile groups and articles made from such polymers so as to impart colors thereto ranging from yellow to brown, according to which sulfur is introduced into said polymers and articles made therefrom by treating them with an aqueous solution of hydrosulfuric acid or salts thereof in a neutral medium with a subsequent treatment of said polymers and articles in a weakly acidic medium. Further treatment with a metal salt capable of forming a chelate with the sulfhydryl groups in the dyed polymer imparts decay-resistance, light-fastness, thermal stability and hydrophobic properties.

3,790,342

PROCESS OF PRODUCING A DYED CLEANED MATERIAL

Ronald Barr Love, and Alistair Templeton Stewart, both of Paisley, Scotland, assignors to J. & P. Coats Limited, Glasgow, Scotland

Filed Jan. 28, 1972, Ser. No. 221,831

Claims priority, application Great Britain, Jan. 29, 1971, 3536/71; Jan. 29, 1971, 3537/71; Apr. 3, 1971, 8623/71

Int. Cl. D06p *5/02, 1/68*

U.S. Cl. 8—73 **9 Claims**

A process of producing a dyed cleaned material comprising first applying to virgin material a dyeing medium, next drying the material and then treating the material with a cleaning substance containing acetone. The acetone may be diluted with water in a proportion up to 50 percent water. The dyeing medium may be a non-aqueous solvent dyeing medium. The non-aqueous dyeing medium may be combined with a material for which the solvent has an affinity higher than it has for the dye, e.g., a silicone.

3,790,343

METHOD FOR BLEACHING FIBROUS MATERIALS AND COMPOSITIONS THEREFOR

Seijiro Ikeda, 22/1,7-chome Nakayamate-dori, Ikuta-ku, Kobe-shi, Hyogo-ken, Japan

Filed Dec. 10, 1971, Ser. No. 206,874

Int. Cl. D06l *3/08*

U.S. Cl. 8—108 **3 Claims**

A bleaching composition for a fibrous material comprises an aqueous medium having dissolved therein sodium chlorite and sodium polyphosphate, said sodium polyphosphate being such that the molar ratio of Na_2O to P_2O_5 is greater than 0.1 but less than 1.0 and that a 1 weight percent aqueous solution thereof has a pH of not higher than 3; and a method for bleaching a fibrous material comprises bleaching a fibrous material with said composition.

3,790,344

AGENTS FOR IMPROVING THE FASTNESS TO WET PROCESSING

Gerritt Frickenhaus, Wuppertal-Ronsdorf; Martin Meister, Leverkusen; Hellmuth Pantke, Leichlingen, and Erhard Schuffenhauer, Cologne, all of Germany, assignors to Farbenfabriken Bayer Aktiegesellschaft, Leverkusen, Germany

Filed Nov. 30, 1970, Ser. No. 93,812

Claims priority, application Germany, Dec. 3, 1969, 1960616

Int. Cl. D06p *5/02*

U.S. Cl. 8—165 **18 Claims**

Process for improving the fastness to wet processing of dyeings obtained on synethetic polyamides with anionic and/or cationic dyestuffs wherein the dyeings are aftertreated with aqueous liquors containing condensation products of a higher molecular weight prepared from (*a*) 4,4′-dioxydiphenylsulphon, (*b*) formaldehyde and (*c*) phenol sulphonic acid, naphthalene sulphonic acid, sodium sulfite or sodium hydrogen sulfite, using the components (*a*), (*b*) and (*c*) in a molecular ratio of 1:0.7–1.1:0.7–0.2.

3,790,345

DETECTION OF DECONTAMINATION OF WATER

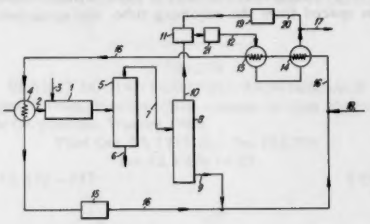
Geoffrey Harry Mansfield, and William Lyth, both of Norton, Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed July 19, 1971, Ser. No. 163,834

Claims priority, application Great Britain, July 28, 1970, 36,504/70

Int. Cl. G01m *3/20*

U.S. Cl. 23—230 R **3 Claims**



Contamination of one aqueous stream by a second such stream, e.g., through leakage in a heat exchanger, is detected by providing phenol in the second stream and analysing for the presence of phenol in the first stream.

3,790,346

HEATING SYSTEM

David Alan Ritchie, St. Louis, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

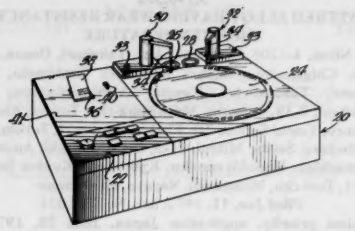
Filed July 30, 1971, Ser. No. 167,376

Int. Cl. G01n *21/24, 33/16*

U.S. Cl. 23—253 R **9 Claims**

A testing apparatus for automatically determining prothrombin times and other similar factor assays. A turntable conveyor moves successive blood plasma samples in con-

tainers to a test station where each sample is tested, pertinent information sensed and fed to a printer for readout. Preliminary to the testing station is a first reagent dispenser where a reagent is dispensed to each sample and a second reagent dispenser is located at the testing station for adding a second reagent. Intermediate the two reagent dispensers is a sample incubation device which intimately contacts each container to apply heat thereto to incubate the sample contained therein.



Each reagent dispenser is provided with a reagent reservoir and associated magnetic stirring system. A unique system for decoupling the magnetic stirring system from a magnetic stirrer and moving the magnetic stirrer out of the path of a pipette forming part of each reagent dispenser is provided. At the testing station, a unique photosensitive detection device is provided for sensing the formation of clots after the second reagent is added.

3,790,347

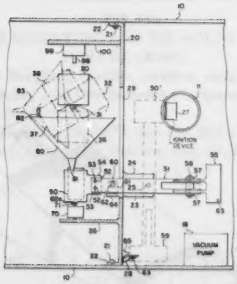
APPARATUS FOR REMOTE HANDLING OF MATERIALS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Robert B. Kimball, Anaheim; David T. Hodder, Playa Del Ray, both of Calif., and Walter W. Wrinkle, deceased, late of Huntington Beach, Calif.

Filed Dec. 30, 1971, Ser. No. 214,084

Int. Cl. B01f *11/00;* **B01l** *1/00;* **G01n** *31/12*

U.S. Cl. 23—253 PC **26 Claims**



Apparatus for remote handling of materials. A closed housing is provided with first and second containers and first and second reservoirs for holding materials to be mixed. The materials are transferable from the reservoirs to the first container; in which they are mixed. The mixed materials are then conveyed from the first container to the second container preferably by dumping the mixed materials into a funnel positioned over the second container. The second container is then moved to a second position for analysis of the mixed materials. For example, the materials may be ignited and the flame analyzed. Access, such as a sight port, is provided in the housing at the analysis position. The device provides a simple and inexpensive apparatus for safely mixing a pyrophoric material such as barium metal and an oxidizer such as molybdenum trioxide which together form a thermite type mixture that burns to produce a large quantity of heat and light.

3,790,348

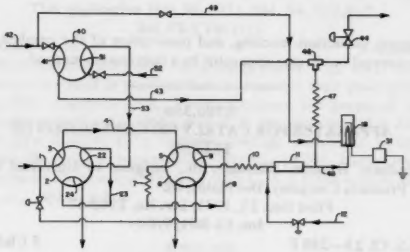
APPARATUS FOR DETERMINING THE CARBON MONOXIDE, METHANE AND TOTAL HYDROCARBONS CONTENT IN AIR

Clayton J. Bossart, Monroeville, and Albert A. Poli, Pittsburgh, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Mar. 22, 1972, Ser. No. 237,106

Int. Cl. B01d *53/00;* **G01n** *31/08, 31/12*

U.S. Cl. 23—254 EF **8 Claims**



An air sample to be analyzed for carbon monoxide and methane is delivered to a chromatograph column that is connected by a reactor with a hydrogen flame ionization detector. The reactor converts carbon monoxide in the sample into methane. The amount of carbon monoxide and methane in the sample is determined by measuring the electrical conductivity of the detector. To measure total hydrocarbons in the impure air being sampled, a stream of the sample air is delivered to a conduit communicating with the detector. When total hydrocarbons are not being detected, a stream of pure air is delivered to the conduit continuously to establish a reference point for the analyses.

3,790,349

REACTOR FOR CATALYST PREPARATION

Pavel Petrovich Andreichev, pereulok Obukha, 4, kv. 4, Moscow, U.S.S.R.

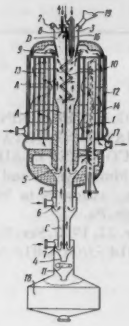
Filed Sept. 4, 1970, Ser. No. 69,610

Int. Cl. B01j *11/06, 11/18*

U.S. Cl. 23—284 **1 Claim**

A reactor for catalyst preparation by treating a granular stock material with a reducing gas which comprises a reaction chamber made as a vertical tube whose cross-section is reduced in the direction of the stock material flow, a chamber for drying and thermally treating the stock material, a chamber for cooling the catalyst, and a chamber for passivat-

ing the catalyst. The reactor is provided with preheating and heat-exchange devices. The reactor construction allows the



drying, reduction, cooling, and passivation of the catalyst to be carried out in one apparatus by a continuous method.

3,790,350

APPARATUS FOR CATALYTIC CONVERSION OF FLUIDS

Vladimir Haensel, Hinsdale, Ill., assignor to Universal Oil Products Company, Des Plains, Ill.

Filed Dec. 22, 1971, Ser. No. 210,937

Int. Cl. B01j 9/04

U.S. Cl. 23—288 F **5 Claims**

Apparatus for catalytic conversion of fluids. The apparatus includes a catalyst element that comprises a support wire to which a plurality of subdivided catalyst particles having openings therethrough are threaded thereon. Means is provided on the support wire for maintaining the catalyst particles in place.

3,790,351

SINTERED ALLOY HAVING WEAR RESISTANCE AT HIGH TEMPERATURE

Itaru Niimi, Nagoya; Kametaro Hashimoto, Toyota; Kenzi Ushitani, Toyota; Yoichi Serino, Toyota; Ko Ishihara, Toyota; Seishu Mitani, Kyoto, and Kunizo Imanishi, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota City, Japan

Filed Oct. 4, 1971, Ser. No. 186,424

Claims priority, application Japan, Apr. 26, 1971, 46-027385

Int. Cl. C22c 1/04; B22f 5/00, 3/16; B21k 1/24

U.S. Cl. 29—182 **2 Claims**

The present invention relates to sintered alloys having wear resistance at high temperature composed of a copper-base alloy containing copper as a principal constituent and 4 to 15 percent of tin, 4 to 25 percent of nickel, and 4 to 25 percent of chromium.

3,790,352

SINTERED ALLOY HAVING WEAR RESISTANCE AT HIGH TEMPERATURE

Itaru Niimi, 4-1205, Obasama, Aza, Takahari, Ooaza, Idaka-cho, Chigusa-ku, Nagoya; Kametaro Hashimoto, 29, 5-chome, Takami-cho, Toyota, Aichi-prefecture; Kenzi Ushitani, 3-38, 4-chome, Maruyama-cho, Toyota, Aichi-prefecture; Yoichi Serino, 2-1, Ekakushin-machi, Toyota, Aichi-prefecture; Seishu Mitani, 11-5, Higashi-machi, Anshubaba, Yamashina, Higashiyama-ku, Kyoto, and Kunizo Imanishi, 2-11, Toei-cho, Mizuho-ku, Nagoya, all of Japan

Filed Jan. 11, 1972, Ser. No. 217,031

Claims priority, application Japan, June 28, 1971, 46-046994

Int. Cl. C22c 1/04; B22f 7/00, 5/00; B21k 1/24

U.S. Cl. 29—182.1 **12 Claims**

The present invention relates to iron-base sintered alloys having excellent wear resistance at high temperatures, and more particularly to alloys adapted for fabricating valve seat rings of internal combustion engines. The alloys of the present invention are characterized by infiltrating selected metals having lubricating properties or the alloys thereof into the pores of iron-chromium-carbon base sintered alloys having significant mechanical strength and heat resistance.

3,790,353

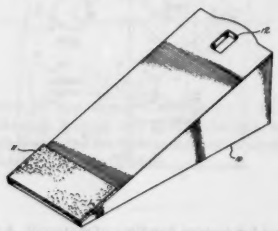
HARD-FACING ARTICLE

Hewy E. Jackson, Livingston, and Howard B. Myers, Humble, both of Tex., assignors to The Servco Company, a division of Smith International Inc., Long Beach, Calif.

Filed Feb. 22, 1972, Ser. No. 227,777

Int. Cl. C22c 29/00, 1/05; B22f 7/04, 7/08

U.S. Cl. 29—182.7 **8 Claims**



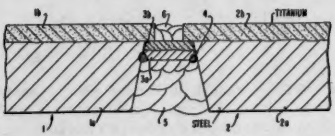
A hard facing wear pad usable, for example, by brazing to a digger tooth or the like is provided in practice of this invention. The wear pad is from 70 to 85 percent by volume particles of cemented metal carbide in a metal matrix having a melting point not substantially higher than the melting point of the metal cementing the carbide. The cemented carbide particles are in the size range of from about 6 to 30 U.S. Sieve, and the thickness of the pad is within limits determined by the cemented carbide particle size.

3,790,354

WELDING ARRANGEMENT OF EXPLOSIVE-PLATED METAL SHEETS

Ulf Richter, Wurgendorf, Germany, assignor to Dynamit Nobel Ag., Troisdorf, Germany

Division of Ser. No. 16,128, March 3, 1970, Pat. No. 3,629,932. This application Aug. 18, 1971, Ser. No. 154,637
Claims priority, application Germany, Mar. 3, 1969, 1910674
Int. Cl. B32b *15/00*
U.S. Cl. 29—191 5 Claims



The present disclosure relates to a process and arrangement of elements for welding explosive plated metal sheets which substantially eliminate the formation of cracks when the weld is exposed to mechanical stresses.

3,790,355

COATED METAL ARTICLE AND METHOD OF COATING

Stephen P. Palisin, Jr., Cleveland, Ohio, assignor to The Empire Plating Company, Cleveland, Ohio

Continuation of Ser. No. 887,397, Dec. 22, 1969, abandoned. This application Nov. 18, 1971, Ser. No. 200,224
Int. Cl. B23p *3/00*; C23c *7/26*
U.S. Cl. 29—195 3 Claims

A metal article having a corrosion-resistant, adherent surface-covering, hydrophobic, thermosetting polymer film.

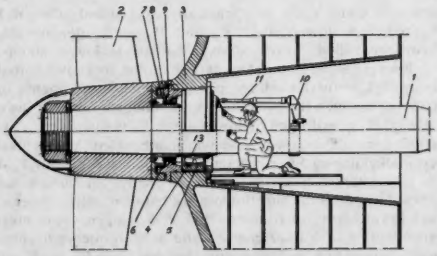
A method of coating a metal article to make it resistant to corrosion comprising the steps of forming a metallic chromating surface thereof, applying a hydrophobic, thermosetting polymer to a surface thereof and heating the article at a temperature of at least about 300° F. to convert the polymer into a hard, adherent film.

3,790,356

DEVICE FOR MOUNTING AND DISMOUNTING A STERN POST BEARING

Folke Gunnar Bergling, Partille, Sweden, assignor to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Filed Oct. 24, 1972, Ser. No. 301,212
Claims priority, application Sweden, Dec. 22, 1971, 16443/71
Int. Cl. B23p *19/04*, *11/00*
U.S. Cl. 29—201 2 Claims



The present invention relates to a device for mounting and dismounting a stern post bearing and possibly a seal for a propeller shaft in a vessel.

3,790,357

METHOD OF PRODUCING CALORIFIC ENERGY

Johann Schroder, Aachen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 861,029, Sept. 25, 1969, abandoned. This application Jan. 13, 1972, Ser. No. 217,639
Claims priority, application Netherlands, Sept. 30, 1968, 6813987
Int. Cl. F24j *1/00*
U.S. Cl. 44—3 R 3 Claims

Calorific energy produced by reacting sulfur hexafluoride with an alloy of lithium and calcium in a ratio such that an eutectic mixture of the resultant fluorides are formed.

3,790,358

RESIDUAL FUELS IMPROVED IN ITS FLOW CHARACTERISTICS BY A COPOLYMER OF C_{22} TO C_{40} LINEAR ALPHA-OLEFIN AND STYRENE OR A C_3 TO C_8 ALPHA-OLEFIN

Albert Rossi, Jersey City; Norman Jacobson, East Brunswick, and Harold N. Miller, Millington, all of N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 762,372, Sept. 16, 1968, abandoned. This application July 30, 1971, Ser. No. 167,867
Int. Cl. C10l *1/16*
U.S. Cl. 44—62 6 Claims

Hydrocarbon polymers comprising linear C_{18+} alkyl side chains are added to residual fuels to improve their pour point and flow characteristics. These polymers are prepared by polymerizing C_{20}–C_{40} alpha-olefins in the presence of a Ziegler-type catalyst to a number average molecular weight within the range between about 500 and 125,000. Particularly effective polymers are prepared from C_3–C_{18} alpha-olefins and C_{20}–C_{40} alpha-olefins.

3,790,359

MIDDLE DISTILLATE FUEL HAVING INCREASED LOW TEMPERATURE FLOWABILITY

Nicholas Feldman, Woodbridge, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.

Filed Mar. 17, 1969, Ser. No. 807,966
Int. Cl. C10l *1/18*
U.S. Cl. 44—62 5 Claims

The low temperature flowability of a middle distillate petroleum fuel oil boiling within the range of about 250° to about 700°F. at atmospheric pressure is improved by adding to the fuel oil from about 0.1 to about 3 weight percent of an essentially saturated hydrocarbon fraction which is substantially free of normal paraffinic hydrocarbons and which has a number average molecular weight in the range of about 600 to about 3,000, together with a flow-improving additive such as a copolymer of ethylene and an unsaturated ester, wherein said copolymer has less than six methyl terminating side branches per 100 methylene groups, the weight ratio of said saturated hydrocarbon fraction to said copolymer flow-improving additive being in the range of about 25:1 to 1:1.

3,790,360

PROCESS FOR PRODUCING METAL COATED GLASS-CERAMIC ARTICLES

Taketosi Kato; Masakazu Umetsu, both of Nagoya, and Toshio Kobayashi, Aichi, all of Japan, assignors to Ishizuka Garasu Kabushiki Kaisha, Aichi-ken, Japan

Filed Feb. 23, 1972, Ser. No. 228,757
Int. Cl. C03b , *29/00*
U.S. Cl. 65—32 3 Claims

A method of producing a metal coated glass-ceramic article which comprises melting a glass-forming batch containing a nucleating agent and 0.05 to 5 percent by weight, calculated as the metal based on the total weight of the glass-forming batch, of at least one metal compound selected from copper compounds and silver compounds, forming the melt into a

glass article of desired configuration, heating the formed glass article in a reducing atmosphere to devitrify the glass, while causing the metallic ions generated from said metal compound by said reducing atmosphere to migrate through the glass matrix and diffuse to the surface of said devitrified article and to reduce the metallic ions to the state of metallic particles on the surface, heating the article in an oxidizing atmosphere to oxidize the metallic particles to the state of metal oxide crystalline particles bonded to each other, and heating the so obtained article again in a reducing atmosphere to reduce said metal oxide to its metallic state on the surface of devitrified article.

3,790,361

MANUFACTURE OF FLAT GLASS

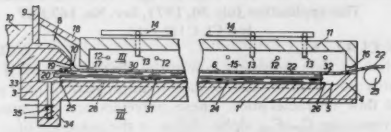
Jack Lawrenson, St. Helens, England, assignor to Pilkington Brothers Limited, Liverpool, Lancashire, England

Filed Sept. 22, 1971, Ser. No. 182,770

Claims priority, application Great Britain, Sept. 23, 1970, 45363/70

Int. Cl. C03b *18/00*

U.S. Cl. 65—99 A **14 Claims**



In the float process for the manufacture of flat glass in ribbon form on a bath of molten metal, the movement of the ribbon along the bath surface creates a forward flow of molten metal in a surface layer of the bath, which forward flow is segregated by flow dividing means for an upstream return flow of cooler molten metal along the bottom of the bath.

3,790,362

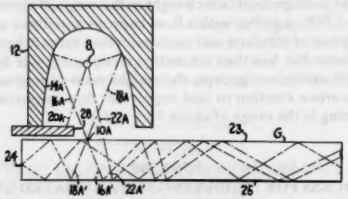
DIRECTIONAL CONTROL FOR THERMAL SEVERING OF GLASS

John R. Dahlberg, Jeannette; James L. Oravitz, Cheswick, and Edmund R. Michalik, West Mifflin, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 72,353, Sept. 15, 1970, Pat. No. 3,709,414. This application June 21, 1972, Ser. No. 265,082

Int. Cl. C03b *33/02*

U.S. Cl. 65—174 **7 Claims**



This invention relates to non-contact thermal severing of glass and includes methods and apparatus for altering at least some of the radiation from a thermal source so that a temperature profile that would ordinarily otherwise tend to be asymmetrical becomes symmetrical about an intended path of cut. The problem of asymmetrical temperature profiles occurs, for example, in non-bisecting cuts. The cut is completed either by continuing with the application of radiant heat until a tensile stress of about 1,000 pounds per square inch is generated within the glass, or by applying a bending moment about the thermal score.

3,790,363

CINNAMYL CARBAMATES AND THEIR UTILITY AS HERBICIDES

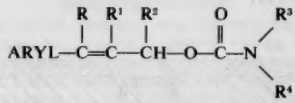
Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 719,700, April 8, 1968, Pat. No. 3,697,582. This application July 12, 1971, Ser. No. 161,988

Int. Cl. A01n *9/24, 9/28*

U.S. Cl. 71—106 **21 Claims**

Compounds correspond to the formula



wherein ARYL is phenyl, substituted phenyl, naphthyl and substituted naphthyl in which said substituents are halogen, lower alkoxy, lower alkyl, or when ARYL is substituted phenyl the substituent is also 3,4-oriented-methylenedioxy;

R and R^1 are independently hydrogen, lower alkyl, chlorine or bromine; R^2 is hydrogen, lower alkyl, or phenyl; and R^3 and R^4 are independently hydrogen, alkyl, lower alkenyl, carbethoxymethyl, phenyl and substituted phenyl in which said substituents are selected from the group halogen, lower alkoxy, lower alkyl and nitro, provided that only one of R^3 or R^4 is phenyl or substituted phenyl. The above-defined compounds are effective herbicides. Representative compounds are: cinnamyl-N-methylcarbamate; 2-chlorocinnamyl-N-methylcarbamate; cinnamyl-N-allylcarbamate; cinnamyl carbamate; o-bromocinnamyl-N-methyl carbamate.

3,790,364

META-ANILIDE UREA COMPOSITIONS AND THEIR UTILITY AS HERBICIDES

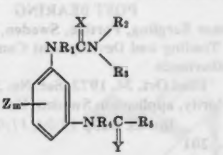
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 23,021, March 26, 1970, Pat. No. 3,642,891, Continuation-in-part of Ser. No. 746,007, July 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 662,573, Aug. 23, 1967, abandoned. This application Sept. 13, 1971, Ser. No. 180,075

Int. Cl. A01n *9/20*

U.S. Cl. 71—120 **25 Claims**

Meta-anilide urea compositions have the formula:



in which X and Y are, independently, oxygen and sulfur; R_1 is hydrogen or lower alkyl; R_2 and R_3 are, independently, hydrogen, alkyl, lower alkoxy, haloalkyl, lower alkenyl, cycloalkyl having from 3 to 6 carbon atoms, inclusive, carbalkoxyalkyl, furfuryl, naphthyl, phenyl or substituted-phenyl, inclusive, in which the substituents are halogen, nitro, or lower alkoxy; R_4 is hydrogen or lower alkyl; R_5 is hydrogen, alkyl, ethyl cycloalkyl, lower alkenyl, halogenated lower alkyl, cycloalkyl having 3 to 6 carbon atoms, inclusive, pinonoyl 2,4-dichlorophenoxymethylene, benzyl, phenyl, or substituted-phenyl in which the substituents are halogen, nitro, lower alkyl, lower alkoxy or trihalomethyl; Z is halogen, lower alkyl, nitro, amino or trifluoromethyl, and *m* is an integer having a value from 0 to 4, inclusive, provided that when R_1, R_2, R_3 and R_4 are each hydrogen, X and Y are each oxygen and m is O, then R_5 is other than methyl or ethyl. The compounds are useful as herbicides and they exhibit both preemergence and post-emergence activity. Representative compounds are: 1-

(3′-isobutyramidophenyl)-3-methyl urea, 1-cyclohexyl-3-(3′-propionamidophenyl)urea, 1-butyl-3-(3′-propionamidophenyl) urea, 1-butyl-3-(3′-isobutyramidophenyl)urea, 1-(3′-nitrophenyl)-3-(3′-isobutyramidophenyl) urea, 1-N,N-dimethyl-3-(pivalamidophenyl)urea, 1-(3′-propionamidophenyl)-3-n-butyl thiourea, and 1-(3′-pestafluoropropionamido phenyl)3,3-dimethyl urea.

3,790,365

METHOD OF MAKING METAL FOAMS BY SEQUENTIAL EXPANSION

Leonard M. Niebylski, Birmingham, and Chester P. Jarema, Detroit, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 879,515, Nov. 24, 1969, abandoned. This application June 21, 1971, Ser. No. 155,210

Int. Cl. C21b

U.S. Cl. 75—20 F **4 Claims**

Metal foams are produced by decomposing a blowing agent in a molten metal such that there is an initial and a subsequent expansion due to blowing gas. The sequential expansion can be conducted by more than one addition of blowing agent to the molten metal to be expanded, or by allowing the molten mass to expand, applying agitation to collapse the foam, and allowing it to expand again, or by forming an intermediate product by expanding and cooling, remelting the intermediate, stirring, and foaming again. Zinc-based foams of fine quality are produced. In a preferred embodiment, substantially pure zinc, titanium hydride (0.1 to 1.5 weight per cent based on weight of metal, and a reaction temperature of from about 475° to about 500°C. are employed.

3,790,366

METHOD OF FLASH SMELTING SULFIDE ORES

Petri B. Bryk, Helsinki; Jorma B. Honkasalo, Westend; Rolf E. Malmstrom; Simo A. I. Makipirtti, both of Pori; Toivo A. Toivanen, Harjavalta, and Olavi A. Aaltonen, Pori, all of Finland, assignors to Outokumpu Oy, Ottokumpu, Finland

Filed Jan. 13, 1970, Ser. No. 2,471

Claims priority, application Finland, Jan. 14, 1969, 104/69

Int. Cl. C22b *15/00, 1/02, 15/04*

U.S. Cl. 75—23 **9 Claims**

A fine-grained concentrate of sulphide ore is suspended by a special dispenser into which a heated downward flow of air, air enriched with oxygen or oxygen containing gas in a vertical reaction shaft of a furnace to oxidize the non-oxidic metal compounds in the concentrate. The gases and the flue dust are separated from the solids which form a smelt on the bottom of the furnace consisting of a matte and a slag on the matte. The partial pressure of sulphur in the gases obtained from the oxidizing smelting carried out in the reaction shaft is increased and/or the partial pressure of oxygen is decreased, in which case the metal oxides contained in the flying dust are converted into corresponding sulphides and most of the iron contained in the slag retains the valence of 2.

3,790,367

ALUMINUM-LEAD METAL FOAMS

Leonard M. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 26, 1971, Ser. No. 202,643

Int. Cl. C21b

U.S. Cl. 75—20 F **2 Claims**

Relatively weak metal foams are produced by decomposing a blowing agent in a molten metal mass to form a foam, and subsequently cooling to form a set cellular product; the molten mass having at least two different metals and at least two liquid phases at the time of foaming. When foaming, the two phases have been intimately intermixed. One metal can be aluminum.

3,790,368

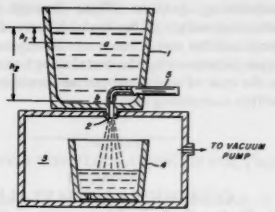
METHOD FOR ENHANCING THE REMOVAL OF VOLATILE SPECIES FROM LIQUIDS

Robert G. Olsson, Edgewood Borough, and Ethem T. Turkdogan, Pittsburgh, both of Pa., assignors to United States Steel Corporation

Filed June 1, 1971, Ser. No. 148,551

Int. Cl. C21c *7/10;* **B01d** *1/16;* **F26b** *3/12*

U.S. Cl. 75—49 **6 Claims**



A method for effecting the disintegration of a liquid into exceedingly fine droplets, thereby effecting an increase in the surface area of the liquid with a concommitant increase in the removal rate of volatile impurities. A non-deleterious gas is injected in the form of bubbles into the liquid, prior to its passage through an orifice into a region of lower pressure, whereby the expansion of the gas bubbles causes the liquid streaming through the orifice to spread radially and disintegrated.

3,790,369

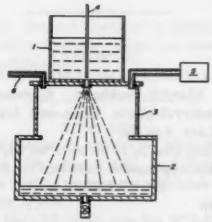
METHOD FOR ENHANCING THE REACTION OF A SPECIES OF A LIQUID WITH A FLUID SUBSTANCE

Robert G. Olsson, Edgewood Borough, and Ethem T. Turkdogan, Pittsburgh, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed June 1, 1971, Ser. No. 148,672

Int. Cl. C21c *7/10;* **B01d** *1/16;* **F26b** *3/12*

U.S. Cl. 75—49 **14 Claims**



A liquid stream is caused to disintegrate in a spray of fine droplets, thereby markedly increasing the amount of surface area available for reaction. The liquid is forced through an orifice into a chamber of lower pressure; prior to its entrance into the chamber, fine bubbles of a gas are entrained within the liquid. After entry into chamber, the individual bubbles expand radially, causing the stream to be broken into sheets of fine droplets, which then react with a gas or liquid in the chamber and/or with injected gas.

3,790,370

REMOVAL AND RECOVERY OF METALS FROM POLLUTED WATERS

Jean-Marc Lalancette, Sherbrooke, Quebec, Canada, assignor to Universite de Sherbrooke, Sherbrooke, Quebec, Canada

Filed Dec. 23, 1971, Ser. No. 211,617
Int. Cl. C01g *13/02*; C22b *43/00*; C01b *5/00*
U.S. Cl. 75—108 10 Claims

A process for removing metal ions such as mercury, copper, cadmium, zinc, lead, nickel or silver from polluted waters includes causing the metal polluted water and a sulfur-containing precipitating agent to diffuse through peat whereby a water insoluble sulfide of the metal is formed and is adsorbed on the peat and the metal free water is recovered. The process also relates to recovering the metal either as metal oxide or as metal in the case of silver, copper and mercury by burning the metal sulfide-containing peat.

3,790,371

CORROSION-RESISTANT ALLOY

David A. Karlyn, Peabody, Mass., assignor to USM Corporation, Boston, Mass.

Filed Dec. 16, 1971, Ser. No. 208,884
Int. Cl. C22c *19/00*
U.S. Cl. 75—170 2 Claims

Corrosion-resisting alloy useful for molding surface formed of the alloy for molding of resin, the alloy including nickel, copper andberyllium in certain ranges of proportions.

3,790,372

CO-NI-CR BASE AUSTENTIC ALLOYS PRECIPITATION STRENGTHENED BY INTERMETALLIC COMPOUNDS AND CARBIDES

Mahesh C. Chaturvedi, Ste. 1105, 2080 Pembina Hwy., Winnipeg, Manitoba, Canada

Filed May 4, 1972, Ser. No. 250,230
Int. Cl. C22c *19/00*
U.S. Cl. 75—134 F 3 Claims

An alloy of Cobalt, Nickel and Chromium having a face centered cubic structure and precipitation strengthened by intermetallic compounds or carbides. This alloy has high strength coupled with ductility and corrosion resistance making it particularly suitable for use in surgical or orthopedic implantation.

3,790,373

ALLOY ON ALUMINUM-ZINC-BASIS

Erich Pelzel, Munich-Puchheim, Germany, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Dec. 3, 1970, Ser. No. 94,938
Claims priority, application Austria, Feb. 5, 1970, 1045/70
Int. Cl. C22c *21/00*
U.S. Cl. 75—146 3 Claims

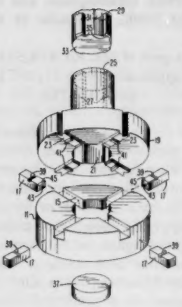
The invention relates to an alloy on aluminum-zinc-basis consisting of 38 to 75 % aluminum, nickel, and, if desired, magnesium and copper, remainder zinc, wherein the improvement resides in that the nickel content amounts to at least 0.05 % and maximally corresponds to the course of the eutectic groove in the aluminum-zine-nickel system, this maximum content of nickel amounting to 0.6 % when 38 % aluminum are present, to 1.1 % when 50 % aluminum are present, to 1.7 % when 60 % aluminum are present, to 2.4 % when 70 % aluminum are present, to 2.8 % when 75 % aluminum are present, and progresses continuously between the given values. This alloy is an excellent bearing metal by which the running characteristics are essentially improved.

3,790,374

METHOD FOR FORMING ARTICLES FROM POWDERED METAL

Frank G. Dedek, Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 54,971, July 15, 1970, Pat. No. 3,720,491.
This application Nov. 9, 1972, Ser. No. 305,062
Int. Cl. B22f *3/16*, *3/24*, *5/00*, *7/00*; B41c *1/00*
U.S. Cl. 75—208 R 10 Claims



A method and apparatus for forming a unitary article, such as a printing disk, from powdered metal wherein at least one given face of the article is required to have a preferred grain density. A die, complementary in area and configuration to the given face, is provided for forming the given face of said preferred grain density. The face-forming die is mounted within an aperture in the inner wall of a molding cavity wherein the aperture has an outlet on the cavity and is dimensionally greater than the face-forming die. A space is provided about the face-forming die for the accumulation of a disposable portion of compacted powdered metal of less than said preferred grain density, the space being partially bounded by surfaces around said face-forming die and sloping away therefrom to the walls of the aperture. Powdered metal is placed in the mold and forced against the face-forming die and into the provided space, thereby forming a unitary article having a preferred grain density at one or more given faces while simultaneously providing for the accumulation of the disposable portion of less dense metal which may be removed in subsequent operations. The molded article is sintered to relieve work-hardening and then restruck to insure said preferred grain density and to improve facial definition. The restruck article may be subjected to further heat-treating operations depending on the desired physical characteristics required of the finished article.

3,790,375

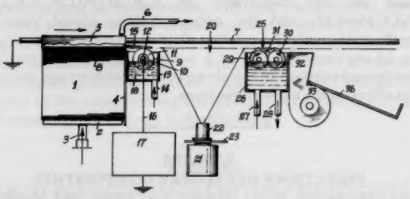
ELECTROSTATIC COPIER

Alan J. Brock, North Adelaide, Australia, assignor to Repco Research Pty. Ltd., Dandenona, Victoria, Austria

Filed Apr. 18, 1972, Ser. No. 245,206
Claims priority, application Austria, Apr. 19, 1971, 4640/71
Int. Cl. G03g *13/00*
U.S. Cl. 96—1 R 9 Claims

A method of producing electrostatic images in a machine using pre-cut or continuous paper, in which a coloured photoconductive medium is applied to the surface of the sheet and charged and then exposed to electro-magnetic waves to

produce a latent image on the photoconductor film by discharging the photoconductor in non-image areas and selectively removing the photoconductor film from the non-image areas to leave a visible image on plain paper in the image areas only.



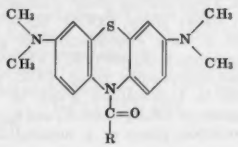
3,790,376

ELECTRON BEAM RECORDING MATERIAL

Masakazu Hashiue; Hiroshi Yamashita, and Nobuyoshi Sekikawa, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

Filed Sept. 3, 1971, Ser. No. 177,761
Claims priority, application Japan, Sept. 3, 1970, 45-77408
Int. Cl. G03c *5/04*
U.S. Cl. 96—27 R 3 Claims

A highly sensitive electron beam recording material is obtained by adding to the system of N-vinylcarbazole and tetrabromomethane in a hydrophilic binder an additive of a leucomethylene blue having the formula



wherein R is a phenyl or naphthyl group which may be substituted by a hydrogen atom, a halogen atom or an alkyl or alkoxyl group having 1 to 4 carbon atoms.

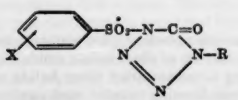
3,790,377

PROCESS FOR INSOLUBILIZING POLYMERS WITH MASKED ISOCYANATES

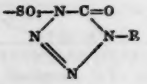
Georges Joseph Smets, Heverlee, and Jean Marie Vandensavel, Tienen, both of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed May 26, 1972, Ser. No. 257,235
Claims priority, application Great Britain, June 2, 1971, 18691/71
Int. Cl. G03c *1/70*
U.S. Cl. 96—35.1 7 Claims

Masked isocyanates in which the isocyanate group or groups may be generated by heating above 100°C are formed by tetrazolinones and bis(tetrazolinones) corresponding to the formula:



wherein X is hydrogen, halogen, nitro, alkyl (1–4 C) or a group of formula:



and R is an aliphatic, aromatic or araliphatic hydrocarbon radical.

The bis(tetrazolinones) may be utilized to cross-link upon heating polymers containing active hydrogen atoms. The heating may occur image-wise or record-wise so that layers composed of mixtures of polymers and bis(tetrazolinones) can be used as heat-sensitive recording materials.

3,790,378

PROCESS FOR THE FORMATION OF POLYMER IMAGES

Yoshihide Hayakawa, and Masato Satomura, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara-shi, Kanagawa, Japan

Continuation of Ser. No. 873,710, Nov. 3, 1969, abandoned.
This application Feb. 24, 1972, Ser. No. 232,316
Claims priority, application Japan, Nov. 2, 1968, 43-80115
Int. Cl. G03c *1/68, 1/70*
U.S. Cl. 96—48 R 30 Claims

Process for forming a polymer image by contacting at least one of o-dioxybenzene, o-aminophenol, o-phenylenediamine, pyrogallol or derivatives thereof with a silver halide photographic layer having a photographic latent image in the presence of a polymerizable vinyl compound and sulfite ions to polymerize the vinyl compound selectively at those areas containing the latent image.

3,790,379

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENTS WITH BOTH COLORED AND COLORLESS COLOR COUPLERS

Yasushi Oishi; Kazuya Sano, and Yoshinobu Yoshida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-shi, Kanagawa, Japan

Continuation-in-part of Ser. No. 824,294, May 13, 1969, abandoned. This application Mar. 7, 1972, Ser. No. 232,518
Claims priority, application Japan, May 13, 1968, 43-32024
Int. Cl. G03c *7/00*
U.S. Cl. 96—55 8 Claims

A photographic element containing diffusion resisting 4-azo-pyrazolone and a colorless phenol or α-naphthol derivative in the silver halide layer.

3,790,380

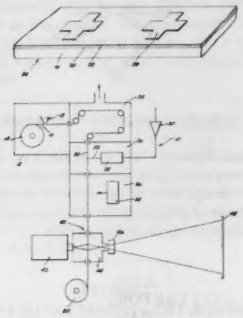
IMAGE RECORDING MEDIUM AND PROCESS

William E. McKee, Woodland Hills, and Erika E. Kaspaul, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 28, 1969, Ser. No. 828,572
Int. Cl. G03c *5/24*
U.S. Cl. 96—48 PD 6 Claims

An electron and/or photon sensitive soluble copper salt in solution is coated upon a substrate, with subsequent evaporation of its solvent. For substrates which resist wetting by the copper salt solution, a wetting agent or film former is employed to obtain an even copper salt coating. For cases where the medium is to be electron exposed, resistivity of the medium is maintained at a sufficiently low level by an additional coating of adequately low resistivity applied beneath the cooper salt layer. After electron or photon exposure, the latent image is developed by exposing the latent image to

metal vapor. Thereupon a stable and visible image is formed. The optical density of the image is proportional to the exposure. When the substrate is transparent, this image can be employed in projection.



3,790,381

ALKALINE PHOTOGRAPHIC DEVELOPER CONCENTRATE

Richard S. Fisch, and Norman Newman, both of St. Paul, Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Sept. 24, 1971, Ser. No. 183,673

Int. Cl. G03c *5/30*

U.S. Cl. 96—66.1 **5 Claims**

A substantially clear aqueous alkaline solution concentrate adaptable for use as a component of a photographic color developer kit, the solution including, as a buffer, carbonate, and further including sulfoxylate.

3,790,382

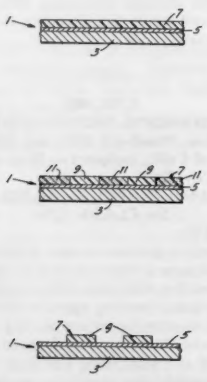
FLUORINATED POLYAMIDE-DIAZO RESIN COATING COMPOSITION

Keith E. Dahlman, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 16, 1971, Ser. No. 134,616

Int. Cl. G03f *7/08*

U.S. Cl. 96—75 **16 Claims**



An oleophobic composition suitable as the ink-receptive areas for printing plates comprising as a dried coating at least 50 percent by weight of light-sensitive diazo resin, no more than 50 percent by weight of a polyamide resin, and an effective amount of a fluoroaliphatic radical containing polymer such as the copolymer of $C_8F_{17}SO_2N(CH_3)CH_2CH_2O_2CCH{=}CH_2$ and the polyoxythylene glycol ester of methacrylic acid. The printing plate so provided is developed by an aqueous solution of a wetting agent which removes unexposed portions of the above coating without any substantial effect on the exposed portions.

3,790,383

INFECTIOUS DEVELOPER COMPOSITION

Isao Shimamura; Eiichi Okusut; Yoo Iijima, and Haruhiko Iwano, all of Minami Ashigara-machi, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-shi, Kanagawa, Japan

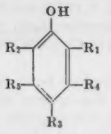
Filed Dec. 21, 1971, Ser. No. 210,546

Claims priority, application Japan, Dec. 21, 1970, 45-115432

Int. Cl. G03c *5/30*

U.S. Cl. 96—66.4 **9 Claims**

An infectious developer for photographic plates for printing containing at least one phenol compound represented by the following formula:



wherein R_1, R_2, R_3, R_4 and R_5 which need not be identical are a hydrogen atom, a hydrocarbon group, a substituted hydrocarbon group, an alkoxy group, COOM, SO_3M where M is a hydrogen atom, a water soluble cation or a hydrocarbon group, a halogen atom, S - R_6 where R_6 is a hydrocarbon group or a substituted hydrocarbon group, COR_7 where R_7 is a hydrogen atom, a hydrocarbon group or a substituted hydrocarbon group, or NR_8R_9 where R_8 and R_9 are a hydrogen atom, a hydrocarbon group or a substituted hydrocarbon group.

3,790,384

LIGHT-SENSITIVE COLOR PHOTOGRAPHIC ELEMENTS WITH IMPROVED IMAGE QUALITY

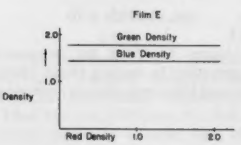
Yashushi Oishi; Yoshinobu Yoshida, and Kazuya Sano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd, Minami Ashigara-shi, Kanagawa, Japan

Continuation of Ser. No. 745,885, July 18, 1968, abandoned. This application Oct. 26, 1971, Ser. No. 192,355

Claims priority, application Japan, July 18, 1967, 46-217

Int. Cl. G03c *1/76, 3/00*

U.S. Cl. 96—74 **9 Claims**



A multi-layer color photographic element comprising a support having a plurality of silver halide emulsion layers, at least one layer being a red-sensitive silver halide emulsion layer, containing a cyan-forming coupler, such as phenol derivatives

and α-naphthol derivatives which have an iodine or a bromine atom at the "para" position to the hydroxyl group. Green-sensitive emulsion layers and blue-sensitive emulsion layers are generally used in combination with said red-sensitive layer. The order of application of said layers is of no importance, as long as the red-sensitive emulsion layer is separated from different emulsion layers by an intermediate layer containing silver halide grains of reduced photo-sensitivity. Specific examples of the cyan-forming coupler and acceptable silver halide materials are defined in the disclosure.

3,790,385

LIGHT-SENSITIVE DIAZO COPYING COMPOSITION AND COPYING MATERIAL PRODUCED THEREWITH

Hartmut Steppan, Wiesbaden-Dotzheim; Fritz Uhlig, and Roland Giesse, both of Wiesbaden-Biebrich, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed July 8, 1971, Ser. No. 160,912

Claims priority, application Germany, July 13, 1970, 2034655

Int. Cl. G03f *7/08*

U.S. Cl. 96—75 **28 Claims**

This invention relates to a light-sensitive copying composition comprising a condensation product of a light-sensitive diazonium compound in admixture with the reaction product of an organic acid free of olefinic double bonds and an epoxide resin.

3,790,386

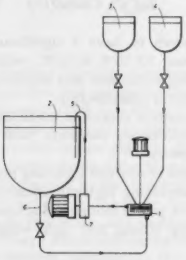
PROCESS FOR THE PRODUCTION OF SILVER HALIDE DISPERSIONS

Rolf-Fred Posse, Cologne-Flittard; Wilhelm Saleck, Schildgen/Bergisch-Gladbach; Herbert Muller; August Randolph, both of Leverkusen, and Franz Moll, Cologne-Stammheim, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 771,545, Oct. 29, 1968, abandoned. This application Nov. 19, 1971, Ser. No. 200,507

Int. Cl. G03c *1/02*

U.S. Cl. 96—94 R **1 Claim**



The preparation of a photo-sensitive salt dispersion having salts of sparing solubility in water which results in a material having a characteristic curve of the flatter gradient type by precipitating a sparingly soluble salt in a small first volume chamber which permits the reactants to be maintained with constant uniformity through the first chamber by stirring. Conducting the resultant dispersion through a conduit to a separated ripening chamber of a second volume many times that of the precipitating first volume. The silver halide emulsion is partially recycled from the separated ripening chamber through a conduit to the precipitation reaction which is outside of the second volume and where the recycled emulsion serves as reaction medium for the further precipitation of further silver halide salts.

The amount of recycled silver halide emulsion is variable to provide an influence on the flatness of the gradient of the characteristic curve of the final emulsion.

3,790,387

PRECIPITATION OF METAL SALTS

Walter J. Musliner, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 31,351, April 23, 1970, abandoned. This application Mar. 20, 1972, Ser. No. 236,219

Int. Cl. G03c *1/02, 1/28*

U.S. Cl. 96—94 **3 Claims**

Improved precipitation processes for forming metal salt crystals are disclosed wherein crystals of metal salts are made by forming nuclei of the metal salt at a high temperature and the remainder of the crystal growth procedure is continued at a lower temperature. In one preferred embodiment, relatively large crystals having a narrow size distribution can be produced, especially when making photographic silver halide emulsions.

3,790,388

DIRECT POSITIVE COLOR PHOTOGRAPHIC MATERIALS

Keisuke Shiba; Kazuya Sano; Akio Okumura, and Seiiti Kubodera, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sept. 13, 1972, Ser. No. 288,826

Claims priority, application Japan, Sept. 13, 1971, 46-71065

Int. Cl. G03c *1/40*

U.S. Cl. 96—100 **10 Claims**

A direct positive color photographic material having a silver halide photographic emulsion layer containing chemically fogged silver halide grains, said silver halide emulsion layer containing a magenta color coupler precursor having a pyrazole nucleus substituted by an acyloxy group at the five-position. The direct positive color photographic material containing such a magenta color coupler precursor has a high sensitivity, shows good clearness in the highlight portions, and has improved stability.

3,790,389

PHOTOXIDIZABLE COMPOSITIONS

Robert A. Heimsch, St. Louis, and Eric T. Reaville, Webster Groves, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 644,121, June 7, 1967. This application Feb. 16, 1971, Ser. No. 115,727

Int. Cl. G03c *1/68*

U.S. Cl. 96—115 R **15 Claims**

This invention relates to light sensitive compositions comprising a photosensitizer and a substrate useful in preparing photographic images.

3,790,390

PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIALS

Keisuke Shiba; Masanao Hinata; Koutarou Yamasue; Akira Sato, and Tadashi Ikeda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 30, 1971, Ser. No. 214,216

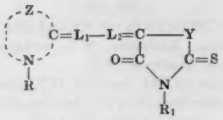
Claims priority, application Japan, Dec. 30, 1970, 45-123036

Int. Cl. G03c *1/08*

U.S. Cl. 96—125 **15 Claims**

A silver halide photographic light-sensitive material wherein one emulsion layer contains silver halide grains with a

mean grain size no larger than 0.9 microns, at least one group VIII metal compound, and at least one sensitizing dye of the formula:



wherein Z, R, R_1, L_1 and L_2 are defined in the specification.

3,790,391

APPARATUS FOR STEAM PRESSURE COOKING OF FOOD

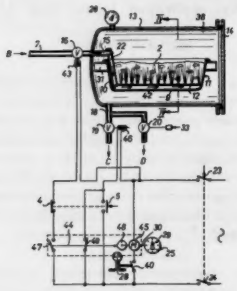
Hans Ulrich Bolleter, Lucerne, and Hansruedi Schulthess, Kriens, both of Switzerland, assignors to Salvis AG, Reussbuhl, Switzerland

Filed Feb. 13, 1973, Ser. No. 332,111

Claims priority, application Switzerland, Feb. 17, 1972, 2311/72

Int. Cl. A47j *27/06*

U.S. Cl. 99—330 **9 Claims**



In a steam pressure cooker into which externally generated steam is introduced to build up a gauge pressure at which the cooking process is greatly accelerated. An open top container for the reception of the food to be cooked is insertable into the vessel. A perforated steam distributer is placed at the bottom of the container and coupled with the steam inlet pipe so that the steam is forced to pass through the food from the bottom upwards and thereby ensures uniform heating of the food throughout its depth in the container. Valves for admitting and exhausting steam are controlled by a timer.

3,790,392

ELECTROLESS COPPER PLATING

Michael N. Gilano, Fullerton, Calif., assignor to Dynachem Corporation, Santa Fe Springs, Calif.

Filed Jan. 17, 1972, Ser. No. 218,459

Int. Cl. C23c *3/02*

U.S. Cl. 106—1 **18 Claims**

Electroless copper plating solutions can be stabilized against autodecomposition by the addition of minute quantities of organothiophosphate compounds. A secondary stabilizer or brightener of the propargyl-type gives added improvement.

3,790,393

CARBONACEOUS BODIES

Frederick Claud Cowland, and Harry Appleby, both of Towcester, England, assignors to Beckwith Carbon Corporation, Van Nuys, Calif.

Continuation-in-part of Ser. No. 59,017, July 28, 1970, abandoned. This application Jan. 20, 1972, Ser. No. 219,521

Claims priority, application Great Britain, July 31, 1969, 38458/69; Nov. 18, 1969, 56331/69

Int. Cl. C04b *35/52*

U.S. Cl. 106—56 **5 Claims**

Chemically resistant bodies of high mechanical strength are obtained by first producing a composite body in which partly-fired carbon-fibre material, made by low-temperature firing of natural or synthetic organic fibre material in an oxidising atmosphere while restraining the fibres from shrinking is incorporated in a matrix of carbonisable thermosetting resin and then heat-treating this body to carbonise the material of the matrix and at the same time complete the conversion of the organic precursor fibres into carbon-fibres. The heat treatment may be carried on to a temperature sufficient to convert the resin of the matrix into vitreous carbon, but greater mechanical strength though somewhat reduced chemical resistance may be obtained by use of carbonisation temperatures which though well above the curing point of the resin are below the temperatures necessary for the production of vitreous carbon. The use of a resin for the matrix whose shrinkage during the carbonising heat treatment is less than that of unrestrained partly-fired carbon fibres results in the production of a carbon-fibre reinforced carbon body in which the fibres are under tensile stress while the material of the matrix is under compressive stress.

3,790,394

CONCRETES AND REINFORCED CONCRETES WITH A LOW EXPANSION COEFFICIENT

Regis Magnan, Montelimar, France, assignor to S. A. Ciments LaFarge, Paris, France

Filed Jan. 4, 1971, Ser. No. 103,775

Claims priority, application France, Jan. 7, 1970, 70.00341

Int. Cl. C04b *7/02*

U.S. Cl. 106—97 **12 Claims**

Concrete is known to have a significant heat expansion coefficient, of about 12.10^{-6} m/m/°C, which has to be considered in designing structures and which can also affect the cost of such structures considerably.

The present invention relates in particular to concrete and self-prestressed reinforced concrete with a low expansion coefficient and density.

The concrete and reinforced concrete products are suitable for all purposes involving highway construction, large slabs, etc., for the nuclear power industry. Such products can also be used in producing strong and light-weight units that can withstand heat.

3,790,395

FOAMED COVER COMPOSITION

Robert E. Eron, 3375, 34th St. N., St. Petersburg, Fla.

Filed Nov. 1, 1971, Ser. No. 194,523

Int. Cl. C08b *25/00, 27/02*

U.S. Cl. 106—122 **6 Claims**

A foamed cover composition made by blending and emitting, from a foam generator, a foamed composition comprising a thickener, a cationic surfactant, a waste filler, and if desired, an additive to effect desired sustained release or sustained acting characteristics.

3,790,396

METHOD FOR STABILIZING PIGMENT SLURRIES

Robert C. Fitton, Bel Air, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Filed Nov. 5, 1971, Ser. No. 198,021
Int. Cl. C09c 3/02
U.S. Cl. 106—288 B 2 Claims

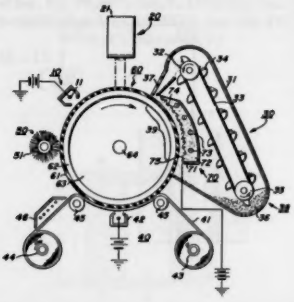
A method for stabilizing aqueous slurries of inorganic pigments which enables the slurries to be shipped or stored without the formation of a hard cake in the bottom of the tank or tank car, is disclosed. Aqueous slurries containing inorganic pigments such as hydrated silicas, calcium silicates, sodium alumino silicates and the like are stabilized by the addition of alkaline earth metal salts. An acidic material such as aluminum sulfate is also added to the slurry to adjust the slurry pH to about 6.0 to 8.6. The method of the invention is highly efficient and does not affect the characteristics or properties of the thus treated pigments.

3,790,397

RETONING CARRIER BEADS IN THE DEVELOPMENT ZONE

Ernest A. H. Weiler, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 858,040, Sept. 15, 1969, Pat. No. 3,648,658. This application Aug. 5, 1971, Ser. No. 169,400
Int. Cl. C03g 13/08, 15/08
U.S. Cl. 117—17.5 1 Claim



A development method wherein developer, comprising a mixture of toner particles and carrier beads, is lifted from a trough or sump and is cascaded over the surface of an insulating plate bearing a latent electrostatic image and the toner is attracted from the carrier to the plate to develop the latent image thereon. The carrier beads are retoned with toner particles from a container located in the development zone as the beads give up toner particles to the plate during the development process. The carrier beads and residual toner particles are directed to the trough where additional toner particles are then added to the mixture, whereupon the returned carrier beads are again lifted from the trough and cascaded over the insulating plate to start the same cycle over again.

3,790,398

METHOD FOR MARKING METAL BLOCKS AND THE MARKED ARTICLES

Waling Dijkstra, Leeuwarden, Netherlands, assignor to Zandleven Curacao N.V., Curacao, Netherlands

Continuation of Ser. No. 775,221, Sept. 10, 1968, abandoned, which is a continuation of Ser. No. 523,551, Jan. 28, 1966, abandoned. This application Jan. 14, 1971, Ser. No. 106,592
Claims priority, application Germany, Apr. 17, 1965, 47059
Int. Cl. C23c 41/00, 39/00
U.S. Cl. 117—37 R 24 Claims

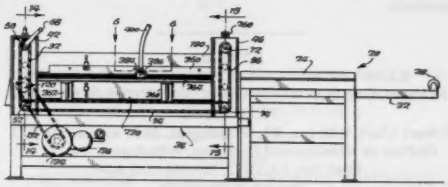
Metal blocks to be subjected to heat treatment are marked for identification with a marking composition resistant to the heat treatment conditions so that the marking is not destroyed during the heat treatment. The marking compositions are characterized by the presence as pigment of strontium chromate, magnesium oxide, or mixtures thereof.

3,790,399

METHOD AND APPARATUS FOR EDGE SEALING CORRUGATED PAPERBOARD

Robert H. Frappier, Agawam, Mass.; Hal W. Tanner, Jr., Georgetown, S.C., and William O. Wagers, Massillon, Ohio, assignors to International Paper Company, New York, N.Y.

Division of Ser. No. 851,973, Aug. 21, 1969, abandoned. This application Sept. 30, 1971, Ser. No. 185,323
Int. Cl. D21b 1/10
U.S. Cl. 117—44 5 Claims



A corrugated core paperboard in which the edges of the core convolutions are sealed by method and apparatus for preparing a film of thermoplastic material along the board edges; the method including the steps of feeding the board along a path, passing the edge of the board through an applicator and applying a film of thermoplastic material to the board edge as the edge passes through the applicator; the apparatus including driven belts between which the board is fed in a path, an applicator along the edge of the path and means for feeding thermoplastic material to the applicator.

3,790,400

PREPARATION OF PLASTIC SUBSTRATES FOR ELECTROLESS PLATING AND SOLUTIONS THEREFOR

John J. Kuzmik, Torrington, Conn., assignor to MacDermid Incorporated, Waterbury, Conn.

Division of Ser. No. 850,249, Aug. 14, 1969. This application July 24, 1972, Ser. No. 274,177
Int. Cl. B44d 5/04
U.S. Cl. 117—47 A 10 Claims

Plastic substrates, such as ABS, are prepared for electroless metal plating by treatment of the surface at a temperature of about 100° to about 175°F. with an activating solution prepared by admixing a glycol ether and an acid stannous chloride-palladium hydrosol. In the hydrosol, catalyst metal particles of colloidal or semicolloidal nature are present.

3,790,401

METHOD FOR THE PREPARATION OF COMPOSITE WOOD-POLYMER PRODUCT

Jack Maine, Saginaw, Mich., assignor to C. W. Maine & Sons, Inc., Saginaw, Mich.

Continuation-in-part of Ser. No. 714,066, March 18, 1968, Pat. No. 3,560,255. This application Jan. 27, 1971, Ser. No. 110,272
Int. Cl. B44d 1/28, 1/092; B27k 3/34
U.S. Cl. 117—59 8 Claims

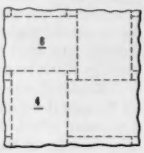
A method of manufacturing a composite wood-polymer product comprising wood permeated throughout with a polymer of tert-butylstyrene, and the resultant product is described. The composite product is characterized by polymer in the cells or pores of wood between adjacent fibers and in

the cell walls of the fibers. The product is tough, durable, extremely moisture resistant, and has the appearance of the original wood.

3,790,402
SARAN-ALUMINUM SILICATE COATING
Frank E. Eastes, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Sept. 4, 1970, Ser. No. 69,955
Int. Cl. D21h *1/28*
U.S. Cl. 117—68 **4 Claims**

A coating material particularly useful for coated sheet products of paper and plastic is a blend of aluminum silicate and a copolymer of vinylidene chloride. This coating has good optics and heat seal characteristics with good gas and moisture vapor permeability. The blend in its usual form also contains a wax such as carnauba wax as an essential ingredient. The products including the coating and the process for forming the products.

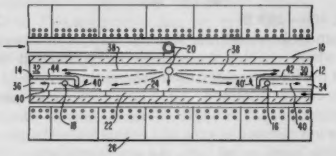
3,790,403
GLASS FABRIC COATED WITH CRACK-FREE FLUOROCARBON RESIN COATING AND PROCESS FOR PREPARING
Robert Clark Ribbans, III, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.
Filed Jan. 13, 1972, Ser. No. 217,846
Int. Cl. B32b *17/04*
U.S. Cl. 117—76 T **7 Claims**



Glass fabric coated with polytetrafluoroethylene is made crack-free by applying a top coat of a melt fabricable tetrafluoroethylene copolymer which is heat bondable to said polytetrafluoroethylene, followed by heating the resultant fabric sufficiently to sinter the polytetrafluoroethylene; this heating also melts the copolymer top coat. A polytetrafluoroethylene over coat can be applied to the copolymer top coat if desired. The dip coating process for applying the polytetrafluoroethylene to the glass fabric is improved by flooding a surface of the fabric with an aqueous dispersion of polytetrafluoroethylene prior to dip coating so that wicking of the dispersion through the thickness of the fabric occurs prior to dip coating.

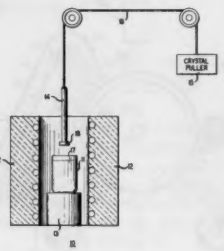
3,790,404
CONTINUOUS VAPOR PROCESSING APPARATUS AND METHOD
Richard R. Garnache, South Burlington; Ashwin K. Ghatalia, Essex Junction, and Ronald A. Michaud, Essex Center, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 19, 1972, Ser. No. 263,915
Int. Cl. C23c *11/08*
U.S. Cl. 117—106 R **12 Claims**

Apparatus for effecting uniform and continuous mass transport reactions, such as oxidation, diffusion, etching, etc., between a gaseous phase reactant and semiconductor substrates. The apparatus comprises a longitudinal process tube, which includes a reaction zone flanked on either side by a combination entrance-exhaust section and an exit-exhaust section. Reactant gas is provided to the reaction zone at a fixed flow rate and allowed to escape from the reaction zone axially through the two exhaust zones. Accurate isolation of the reaction zone is accomplished by passing additional gases



into the entrance and exit zones at a rate sufficient to cause some gas to flow into the reaction zone where it is carried away through the exhaust zones by the axially flowing reacting gas.

3,790,405
CONTROLLED EPITAXIAL GROWTH FROM SUPERCOOLED NUTRIENT-FLUX SOLUTION
Hyman Joseph Levinstein, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.
Filed July 16, 1971, Ser. No. 163,396
Int. Cl. B01j *17/00;* **B44c** *1/18*
U.S. Cl. 117—201 **11 Claims**



Controlled growth of epitaxial layers of a variety of structures including garnet, spinel, and corundum are grown out of supercooled nutrient-flux solutions. Controlled growth, both of composition and physical characteristics, is attributed to the conditions that make the procedure primarily diffusion (rather than atomic kinetic) controlled. Such conditions include high dilution of nutrient and high viscosity of the solution.

3,790,406
METHOD OF TREATING NON-CONDUCTING AND POORLY CONDUCTING FILM
Hiroshi Sakai, 23 Hakuraku, Kanagawa-ku, Yokohama-shi, Kanagawa-ken; Kazuo Igarashi, 128 Suwacho, Hachioji-shi, Tokyo; Takuji Yamamoto, 195 Fujimicho, 6-chome, Tachikowa-shi, Tokyo, and Norimichi Matsuo, 16-25 Shiyoan, 3-chome, Suginami-ku, Tokyo, all of Japan
Filed Dec. 23, 1971, Ser. No. 211,630
Int. Cl. B44d *1/02, 1/20*
U.S. Cl. 117—227 **33 Claims**

The disclosure relates to an applied film of a non-conducting lacquer comprising a mixture of non-conducting or weakly conducting metallic powder with a lacquer base wherein the mixture is changed into a good conductor by applying a conductivating agent in the presence of a solvent. The method lends itself to the manufacture of plate electrodes for batteries, conducting yarn, conducting nets, electrical circuits,

heating elements, charge accumulation prevention shields, radio wave shields, etc. from films of a non-conducting or weakly conducting lacquer.

3,790,407

RECORDING MEDIA AND METHOD OF MAKING

Ronald A. Merten, and Don E. Pickart, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1970, Ser. No. 102,127

Int. Cl. H01f *10/02*

U.S. Cl. 117—240 **5 Claims**

High coercivity metallic magnetic material in finely divided particle form is milled with a lubricant to convert it to a leafing flake. The flakes thus obtained are mixed with a suitable binder vehicle and solvent and coated on a non-magnetic substrate to form a leafed coating in which most of the magnetic flakes float to the surface of the vehicle to form a relatively continuous thin layer of high coercivity magnetic material. When the binder vehicle is dried or cured it firmly adheres the thin layer of magnetic material to the substrate and also provides adhesion between the flakes of magnetic material to thus provide a wear and corrosion resistant magnetic recording media capable of high resolution recording.

3,790,408

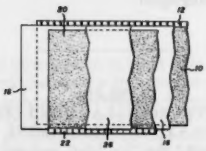
BATTERY COIL CONSTRUCTION

George P. Cromer, Clay, Fla., assignor to General Electric Company, Owensboro, Ky.

Division of Ser. No. 78,807, Oct. 7, 1970, Pat. No. 3,695,935. This application May 30, 1972, Ser. No. 257,754

Int. Cl. H01m *35/16*

U.S. Cl. 136—13 **4 Claims**



An improved cell construction is utilized in which a ruffled edge of the negative plate extends longitudinally beyond the edge of the positive plate at one end of the battery coil and a ruffled edge of the positive plate extends longitudinally beyond the edge of the negative plate at the opposite end of the battery coil. Terminal straps are attached to the extending ruffled edges of the respective plates.

3,790,409

STORAGE BATTERY COMPRISING NEGATIVE PLATES OF A WEDGE-SHAPED CONFIGURATION

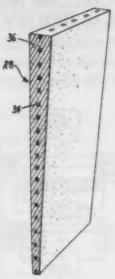
James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Richard S. Bogner, Altadena, Calif., and Charles D. Farris, Flemingsburg, Ky.

Filed Feb. 22, 1972, Ser. No. 228,163

Int. Cl. H01m *43/00*

U.S. Cl. 136—20 **5 Claims**

An improved silver-zinc battery particularly suited for use in an environment wherein the battery operatively is subjected to multiple charge/discharge cycling over extended periods. The battery is characterized by a plurality of positive plates of a planar configuration having interposed therebetween a plurality of negative plates of a wedge-shaped configuration and a



separator system including a highly absorbent material contiguous with the surfaces of the plates and multiple semipermeable membranes interposed therebetween.

3,790,410

METHOD FOR THE MANUFACTURE OF POWDERED TUNGSTEN CARBIDE CONTAINING ELECTRODE MATERIAL

Konrad Mund; Gerhard Richter, and Magdalena Wenzel, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 17, 1972, Ser. No. 227,310

Claims priority, application Germany, Feb. 22, 1971, 2108396

Int. Cl. H01m *13/04*

U.S. Cl. 136—122 **12 Claims**

Method of making electrode material containing tungsten carbide particles which comprises mixing tungsten carbide with a solid or liquid cokable organic substance. A solution of such organic substance may also be used. The organic substance in the mixture is precoked. The organic substance is subsequently coked at a temperature of 800° to 1,000° C.

3,790,411

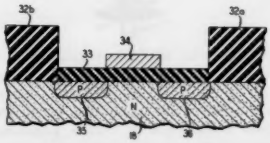
METHOD FOR DOPING SEMICONDUCTOR BODIES BY NEUTRAL PARTICLE IMPLANTATION

Douglas Leon Simms, East Orange; Norman Henry Tolk, Mendham, and Clark Woody White, Dover, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 8, 1972, Ser. No. 232,771

Int. Cl. H01l *7/54*

U.S. Cl. 148—1.5 **1 Claim**



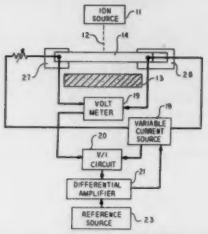
Doping of semiconductor bodies is achieved by bombarding the surface of the semiconductor with a beam of neutral particles to implant particles therein.

3,790,412

METHOD OF REDUCING THE EFFECTS OF PARTICLE IMPINGEMENT ON SHADOW MASKS

Robert Alan Moline, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 7, 1972, Ser. No. 242,124
Int. Cl. H01l 7/54
U.S. Cl. 148—1.5 7 Claims



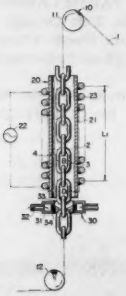
Thermal expansion of shadow masks used in ion implantation processes has been found to cause inaccuracies in the ion implanted pattern. Such inaccuracies are reduced or eliminated by first directing a heating current into the mask, monitoring the resistance of the mask, and controlling the heating current in accordance with monitored resistance. As the mask is bombarded with ions, any temperature rise increases the monitored resistance to automatically reduce the heating current, thus compensating for the thermal effect of ion bombardment.

3,790,413

PROCESS FOR A CONTINUOUS HEAT TREATMENT AND APPARATUS THEREFOR

Norio Kanetake, Tokyo, Japan, assignor to Kabushiki Kaisha Kito, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 212,152
Int. Cl. C21d 1/10
U.S. Cl. 148—16.5 6 Claims



A heat treating process for a link chain or a similar article, characterized wherein a link chain or a similar article is conveyed through a high frequency induction coil and simultaneously heated at an elevated temperature, and is then cooled after a predetermined period of time.

3,790,414

AS-CAST, RARE-EARTH-CO-CU PERMANENT MAGNET MATERIAL

Yoshio Tawara, and Harufumi Senno, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Nov. 14, 1968, Ser. No. 775,651
Claims priority, application Japan, Nov. 15, 1967, 42-74374; Feb. 8, 1968, 43-13233; Mar. 18, 1868, 43-18152; Mar. 18, 1968, 43-18153; Mar. 18, 1968, 43-18154
Int. Cl. C04b 35/00
U.S. Cl. 148—31.57 6 Claims

Permanent magnet material having a high coercive force and a high residual flux density is constituted by an alloy of cerium (15 to 20 mol percent), cobalt (52 to 77 mol percent) and copper (8 to 30 mol percent). The cerium can be replaced by Ce-mischmetal in an amount providing the equivalent quantity of cerium. The material has a novel microstructure. The material can be prepared by melting together the ingredient materials and furnace-cooling to room temperature. Superior results are obtained with specially scheduled heat-treatments including controlled cooling rates. It is not necessary to use fine particle magnet material.

3,790,415

CHEMICAL FOAMING AND SENSITIZING OF WATER-BEARING EXPLOSIVES WITH HYDROGEN PEROXIDE

Ernst A. Tomic, Hagerstown, Md., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 18, 1970, Ser. No. 64,792
Int. Cl. C06b 1/04
U.S. Cl. 149—2 8 Claims

Making foamed semisolid colloidal dispersions of water-bearing blasting agents containing an inorganic oxidizing salt, e.g., ammonium nitrate, fuel, water and adding thereto the gas-generating material hydrogen peroxide that foams and sensitizes the blasting agent.

3,790,416

COMPOSITE PROPELLANT INCLUDING (U) POLYFUNCTIONAL AMINE

Henry C. Dehm, Salt Lake City, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed July 22, 1970, Ser. No. 87,513
Int. Cl. C06d 5/06
U.S. Cl. 149—19 11 Claims

Propellant compositions are provided in which dewetting of the propellant composition under applied stress is substantially reduced. Reduced dewetting is achieved through the use of polyfunctional amines which are capable of forming a chemical bond between the oxidizer (oxygen containing ammonium salt) and the binder in the cured propellant.

3,790,417

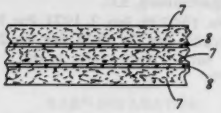
PROCESS FOR PREPARING FIBERBOARD HAVING IMPROVED DIMENSIONAL STABILITY

Arthur R. Paterson, Box 414, Chatham Township, County of Morris, and Annemarie C. Reimschuessel, 20 Junard Dr., Morristown, both of N.J.

Continuation of Ser. No. 780,140, Nov. 28, 1968, abandoned. This application Dec. 17, 1971, Ser. No. 209,461
Int. Cl. B29j 5/00; B32b 21/08
U.S. Cl. 156—62.8 4 Claims

The dimensional stability of fiberboard or hardboard prepared by bonding cellulosic fibers with a thermosetting or thermoplastic resin may be improved by preparing the fiber

mat in a layered construction so that one or more layers of thermosetting or thermoplastic resin is applied between layers



of resin-treated fiber and subsequently curing or flowing the resin in the layered construction under heat and pressure.

3,790,418

PROCESS FOR MAKING A TIGHT COATING AROUND A PIPE FOR CONVEYING HYDROCARBONS AND THE RESULTING HYDROCARBON CONVEYING PIPE LINE

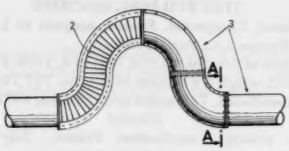
Michel Huvey, Bougival, and Germain Le Meur, Stains, both of France, assignors to Institut Francais Du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison and Societe Anonyme Pour Tous Apparcillages Mecaniques S. A. J. A. La Courneuve, La Courneuve (Seine-Saint-Denis), both of, France

Filed Oct. 8, 1971, Ser. No. 187,787

Claims priority, application France, Oct. 14, 1970, 70.37203

Int. Cl. B32b *5/18*

U.S. Cl. 156—79 **7 Claims**



Process for the formation in situ of a tight coating of pores containing material between a hydrocarbon conveying pipe and a protecting envelope surrounding the same, said material being expansible by contact with the conveyed hydrocarbon so as to obstruct any perforation accidentally occurring in the pipe wall, said process comprising covering the pipe with a sheath of said expansible material containing a curing agent and a porophoric agent, placing the envelope around the pipe and heating the sheath by circulation of a heating fluid so as to produce simultaneously the curing of the sheath and the formation of pores therein by expansion of the sheath in the annular space provided between the pipe and the envelope.

3,790,419

METHOD OF MAKING TEXTILE-REINFORCED ALL-POLYMERIC HOSE

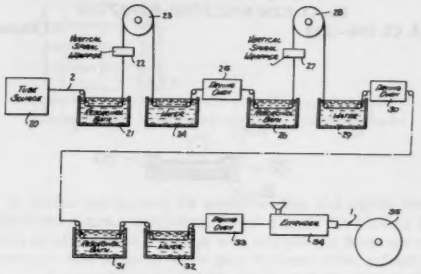
William J. Atwell, Bloomingdale, and Lawrence Cranston, Ramsey, both of N.J., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 55,784, July 17, 1970, Pat. No. 3,654,967, which is a continuation-in-part of Ser. No. 818,236, April 22, 1969, abandoned. This application Sept. 7, 1971, Ser. No. 178,150

Int. Cl. B32b *7/10, 27/34*

U.S. Cl. 156—149 **3 Claims**

An all-polymeric textile-reinforced hose particularly suited for pressure service, typically an all-nylon hose, and a method of making same are disclosed. The hose comprises an inner thermoplastic tube, two or more successive layers of thermoplastic textile reinforcement wound helically (spirally), each successive helically disposed reinforcing layer being disposed oppositely to the preceding layer, and a polymeric outer protective jacket. The innermost reinforcing layer is fused to the inner tube and successive reinforcing layers are fused to one another. This fusion is typically accomplished by softening with a resorcinol-water solution followed by juxtaposition of the components to be joined after which the resorcinol softening agent is removed with a water bath. Before the outer polymeric jacket is applied, the assembly is softened with a softening agent which is thereafter removed; this effects activation of the plastic in the outer helical textile layer and such activation, coupled with the activation in the rest of



the structure as a result of previous treatments with a softening agent and removal thereof, enhances bonding of the outer jacket to the assembly.

The textile reinforcement may be constituted by synthetic multifilament yarns made of continuous thermoplastic filaments, having a total twist (including any so-called producer's or manufacturer's twist) of from 0 to 15 turns per inch, preferably from one to five turns per inch. Alternatively, but generally less preferably, the reinforcement may be formed of thermoplastic staple yarns or of so-called monofils.

3,790,420

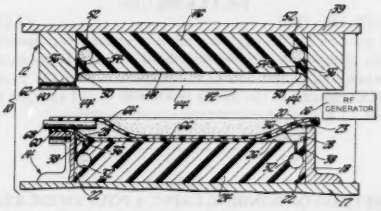
METHOD OF MAKING A SUNSHADE

Joseph Jenei, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1971, Ser. No. 196,341

Int. Cl. B32b *31/00;* **B29c** *17/00*

U.S. Cl. 156—251 **1 Claim**



A method of forming a sunshade envelope in a dielectric embossing press having a pair of opposed electrodes with one of the electrodes having a sharp upstanding edge around a cavity formed in the electrode. The method comprises the steps of positioning a pair of superposed sheets of thermoplastic material over the cavity and closing the press so as to cause the sheets to be compressed between the electrodes along a tear line created by the upstanding edge. The portion of the thermoplastic sheets adjacent the upstanding edge are then positioned in axial alignment and abutting relationship along a vertical plane followed by applying a high frequency alternating current between the electrodes so as to establish a

concentrated electric field at the upstanding edge that serves to fuse the sheets along the upstanding edge and along the vertical plane so as to maintain the portion of the sheets in axial alignment.

3,790,421

COMPOSITE ARTICLES AND METHODS OF MAKING THE SAME

Robert P. Habgood, Jr., Bradford, Pa., assignor to Plexawood, Inc.

Filed July 8, 1970, Ser. No. 53,232
Int. Cl. B29c *6/02, 27/00;* **B29d** *27/04*
U.S. Cl. 156—242 **15 Claims**

A composite article comprised of a core formed of compressed wood chips and resin, and an external portion of irregular thickness of foamed resin, such as polyurethane, formed in situ to the configuration of the composite article. The composite article may be made by forming the core in a mold, allowing the core to shrink, and filling the remainder of the mold to make up for the shrinkage of the core with foamable liquid resin and curing it to the solid state. Alternatively, the composite article may be made by forming the core in a first mold, allowing the core to shrink, placing the core in a second mold corresponding to the configuration of the composite article and filling said second mold with a foamable liquid resin and curing said liquid resin to the solid state.

3,790,422

PROCESS FOR THE AGGLOMERATION OF FLAKES OF EXPANDED POLYURETHANE

Lucien Edmond Jourquin, Wetteren, Belgium, assignor to Sobapur S.A., Luxembourg

Filed Oct. 19, 1970, Ser. No. 82,191
Claims priority, application Belgium, Oct. 17, 1969, 740446
Int. Cl. C09j *5/00*
U.S. Cl. 156—306 **12 Claims**

A process for the agglomeration of expanded polyurethane flakes comprising compressing the flakes at a temperature of between 180°C and 230°C is disclosed. Under the pressure, —NCO radicals in the flakes react with —OH radicals in the flakes.

3,790,423

METHOD OF BONDING USING A POLYAMIDE RESIN

Faber B. Jones, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 790,882, Jan. 13, 1969, abandoned. This application Nov. 22, 1971, Ser. No. 201,106
Int. Cl. C09j *5/06;* **B32b** *15/08, 27/34*
U.S. Cl. 156—331 **9 Claims**

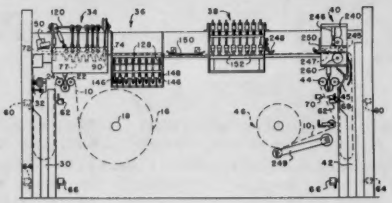
Polyamides, useful as hot-melt adhesives, are prepared by condensing: (*a*) mixtures of at least two reaction products selected from the group consisting of the reaction product of a diamine and isophthalic acid, the reaction product of a diamine and terephthalic acid, and the reaction product of a diamine and a mixture of isophthalic acid and terephthalic acid or (*b*) the reaction product of a diamine and a mixture of isophthalic acid and terephthalic acid.

3,790,424

PULL TAB APPARATUS

William O. Young, Jr., and Walter J. Quattlebaum, both of Spartanburg, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 104,725, Jan. 7, 1971, Pat. No. 3,676,251. This application Jan. 31, 1972, Ser. No. 222,400
Int. Cl. B32b *31/10, 31/00*
U.S. Cl. 156—379 **8 Claims**



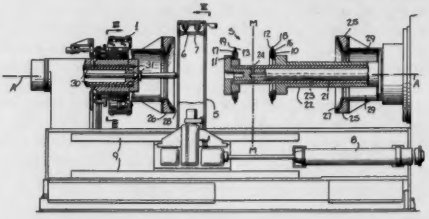
A method and apparatus to accurately punch openings in a web of material and heat seal tabs thereover to provide easy access to the contents of a package formed therefrom. As the machine performs these operations it is also accumulating a predetermined amount of paper for the next cycle.

3,790,425

TIRE BUILDING MACHINE

Jean Leblond, Compiegne, France, assignor to Uniroyal Englebert France S.A., Paris, France

Division of Ser. No. 19,134, March 4, 1970, Pat. No. 3,676,262, which is a division of Ser. No. 717,786, April 1, 1968, abandoned. This application Dec. 14, 1971, Ser. No. 208,016
Claims priority, application France, July 6, 1967, 67.113452
Int. Cl. B29h *17/16*
U.S. Cl. 156—416 **6 Claims**



A tire building machine, comprising a radially expansible and contractable, breaker-tread assembly building drum having a magnetized outer surface for retaining building alignment of metallic cord breaker plies during building of the assembly, a pair of variably spaced tire carcass support and shaping discs coaxial with but spaced from the building drum and providing for direct inflation of a first stage carcass supported thereon, a radially expansible and contractable and axially movable transfer ring for transferring breaker-tread assemblies from the drum to carcasses on the shaping discs, and movable, conical, shaping rings engageable with the outer sidewalls of the carcass during expansion of the same for limiting such expansion to a symmetrically centered pattern with respect to the breaker-tread assembly and the beads of the carcass.

The foregoing abstract is neither intended to define the invention disclosed in this specification, nor is it intended to be limiting as to the scope of the invention in any way.

3,790,426

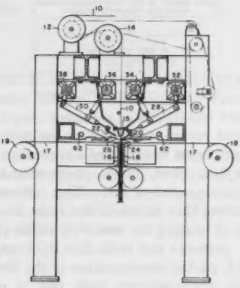
YARN SEPARATOR

Don M. Bylund, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 27, 1972, Ser. No. 238,230

Int. Cl. D04h *11/00*; D05c *15/00*; B32b *5/02*

U.S. Cl. 156—435 **1 Claim**



A yarn separator for the yarn fed into a carpet machine to prevent the yarns from being intertangled and placed in such condition, thereby causing a defect in the fabric.

3,790,427

APPARATUS FOR JOINING WOODEN PARTS

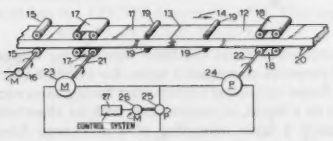
Anton Julius Marstrand, General Banks vei 36, Munkvoll, Norway

Filed Dec. 8, 1971, Ser. No. 206,054

Claims priority, application Norway, Dec. 8, 1970, 4696/70

Int. Cl. B32b *31/04*

U.S. Cl. 156—544 **10 Claims**



A method of and apparatus for joining parts of wooden material into a beam. The method involves applying oppositely directed longitudinal forces to a beam composed of two parts of wooden material having complementary profiled ends. The longitudinal forces press the profiled ends towards one another to remove excessive bonding agent from between the ends. The apparatus includes spaced apart beam engagable devices which move parts of wooden material along a defined path. The spaced apart beam engagable devices are coupled respectively to a driving device and a driven device. The driven device is part of an energy converting circuit which supplies energy to the driving device.

3,790,428

APPARATUS FOR PREFABRICATING VERTICAL WALL PANELS FROM BLOCKS

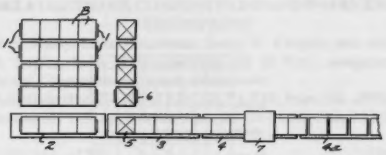
Hans Lingl, Fasanenweg 14, New-Ulm/Ludwigsfeld, Germany

Filed Oct. 5, 1971, Ser. No. 186,628

Claims priority, application Germany, Oct. 8, 1970, 2048944; Jan. 19, 1971, 2102291; June 11, 1971, 2129010

Int. Cl. B32b *31/04*; F04b *1/02*

U.S. Cl. 156—559 **18 Claims**



A device and method for prefabricating wall panels from block-like articles comprising a first gripper for picking up rows of blocks from a storage area and placing them upon a conveyor belt so as to leave gaps between rows; a feeding device for supplying special blocks to at least partially fill these gaps, a mortar applying device which applies mortar to the upper faces of the rows of blocks and a second gripper for transferring the rows from the conveyor to a descending support device in which panels are created by stacking the rows. The panels may then be treated on one or both sides as with stucco. In addition, mortar may be supplied to individual rows or to the whole panel through a plurality of tubes which communicate with the facing edges of adjacent blocks and further, dividing or aligning plates may be associated with the second gripper to produce gaps in the rows to create a plurality of panels or an aperture within a single panel.

3,790,429

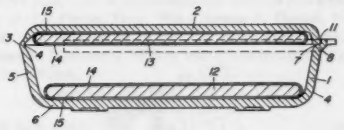
ARTICULATED, UNIT CAST CASE SYSTEM FOR UNGLUING DOCUMENTS

Rene Berger, 33 Rue Troyon 77, Melun la Rochette, France

Filed June 9, 1971, Ser. No. 151,464

Int. Cl. B32b *35/00*

U.S. Cl. 156—584 **4 Claims**



This invention relates to apparatus which will allow documents of small dimensions to be unglued from their bindings without damage. The apparatus includes a unit-cast case actually including two boxes connected by a hinge forming an integral part of the case, with the boxes mentioned differing only by their depth, and with the top one functioning as a cover. To the respective bottom of each box are attached thin plates of asbestos covered with a plasticized grill. The system operates by dampening the asbestos plate of the lower box with distilled water. The document to be unglued is placed directly upon the grill. Impregnation time before unglued varies from several minutes to several hours. The invention can be used in the laboratory; in the medical and pharmaceutical fields; in industry; by stamp collectors; and the like.

3,790,430

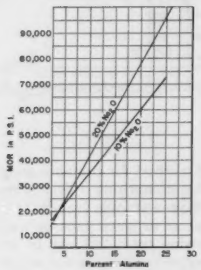
ALKALI ALUMINOSILICATE GLASS ARTICLE HAVING AN ION-EXCHANGED SURFACE LAYER

Ellen L. Mochel, Ojai, Calif., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 555,617, June 6, 1966, abandoned, which is a continuation-in-part of Ser. No. 181,887, March 23, 1962, abandoned. This application Aug. 21, 1968, Ser. No. 754,311

Int. Cl. C03c *21/00*

U.S. Cl. 161—1 4 Claims



This invention relates to the strengthening of glass articles through an ion exchange process wherein alkali metal ions in a surface of a glass article are replaced by larger monovalent metal ions. In carrying out the process, a surface of the glass article is contacted with a source of the larger monovalent ions at an elevated temperature below the strain point of the glass for a sufficient length of time to cause the replacement of small alkali metal ions in the glass surface with the larger monovalent metal ions to a depth of at least five microns, thereby inducing a surface compression layer of this depth on the article. This invention is specifically directed to alkali aluminosilicate glasses.

3,790,431

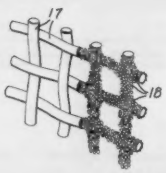
LIGHT-TRANSMISSIVE RETROREFLECTIVE SHEETING

Chi Fang Tung, Lincoln, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 24, 1972, Ser. No. 220,152

Int. Cl. G09f *13/16, 13/06*

U.S. Cl. 161—3.5 13 Claims



Light-transmissive retroreflective sheeting comprising an open web of filaments that are encased around their whole circumference at least over those parts of their length that define open spaces of the web by a monolayer of minute retroreflective microspheres. One use of the sheeting is in internally illuminated signs, where the light-transmissive retroreflective sheeting is incorporated between the internal illumination source and the sign face so as to retroreflect light beamed against the sign face and make the signs retroreflective.

3,790,432

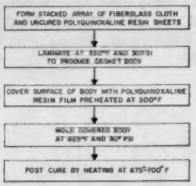
REINFORCED POLYQUINOXALINE GASKET AND METHOD OF PREPARING THE SAME

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Richard Van Auken, 12738 Metate Ln., Poway, Calif.

Filed Dec. 30, 1971, Ser. No. 214,006

Int. Cl. B32b *17/04;* C08g *33/02*

U.S. Cl. 161—93 10 Claims


FORM STACKED ARRAY OF FIBERGLASS CLOTH AND UNCURED POLYQUINOXALINE RESIN SHEETS
LAMINATE AT 350°F AND 30PSI TO PRODUCE GASKET BODY
COVER SURFACE OF BODY WITH POLYQUINOXALINE RESIN FILM PREHEATED AT 300°F
MOLD COVERED BODY AT 625°F AND 30 PSI
POST CURE BY HEATING AT 675°-700°F

A gasket or seal resistant to ionizing radiation and liquid hydrogen temperatures is made up of a laminated polyquinoxaline resin-fiberglass cloth body portion and a molded polyquinoxaline encapsulating film. The laminated body is prepared by stacking thin sheets of the resin alternately with fiberglass cloth and heating the assembly under pressure with the temperature, pressure and resin film thickness being controlled so that only partial impregnation of the fiberglass cloth is produced. The encapsulating resin film is preheated at about 300° F and applied to the laminate body by molding at a temperature of about 625° F, after which the molded gasket is deflashed and post-cured by heating at 675° to 700° F.

3,790,433

MULTILAMINAR SHEET STRUCTURE

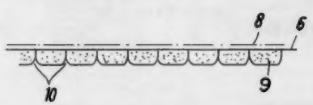
Heinz Baron, Juchener Weg 33, Dusseldorf, Germany

Filed Oct. 12, 1970, Ser. No. 80,025

Claims priority, application Germany, Oct. 25, 1969, 1953873

Int. Cl. B32b *3/10;* A61l *15/00*

U.S. Cl. 161—113 2 Claims



A multilaminar sheet structure suitable for hygienic and medical purposes comprises a layer, for instance of cellulose foil that forms waves and tunnels after having been exposed to moisture or a liquid, in combination with an absorbent layer, for instance a layer consisting of a nonwoven fabric, and possibly with one or more backing layers.

3,790,434

SYNTHETIC FIBERS FOR ARTIFICIAL HAIR AND PRODUCTION THEREOF

Masao Sone; Mitsutoshi Okazaki, and Yasuomi Ueyama, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Apr. 15, 1971, Ser. No. 134,313

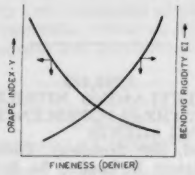
Claims priority, application Japan, Apr. 18, 1970, 45-33217

Int. Cl. D02g *3/00*

U.S. Cl. 161—181 7 Claims

Synthetic fibers for artificial hair are provided which have a bending rigidity EI of 2 – 9.5 dyne. cm^2, a drape index Y of

$0.04 \times 10^{-5} - 0.24 \times 10^{-5}$ cm^{-3} and a product value of EI times Y of $0.28 \times 10^{-5} - 1.8 \times 10^{-5}$. Such fibers have good esthetic



appearance and handle as well as excellent hair - like feel and visual pliability.

3,790,435

SYNTHETIC PAPERS AND METHOD OF MAKING

Shigeru Tanba; Mitsuo Yoshiyasu, and Yoshio Miyabe, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan

Continuation-in-part of Ser. No. 29,176, April 16, 1970, abandoned. This application June 7, 1972, Ser. No. 260,526
Claims priority, application Japan, Apr. 25, 1969, 44-31473
Int. Cl. B32b *3/26, 5/18, 27/08*
U.S. Cl. 161—160 **19 Claims**

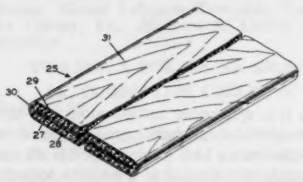
Synthetic papers, endowed with good foldability as well as good paperiness, of a non-laminated structure of one thermoplastic resin film or a laminated structure of at least two thermoplastic resin films. Each of the films is stretched or molecularly oriented, and one or more of the films contain a fine inorganic filler so as to provide paperiness of the film. According to the invention, some of the films contain a certain amount of polystyrene as a foldability improving agent.

3,790,436

EXTRUDED CELLULAR SLAB OF VARYING DENSITIES

Andrew E. Graham, Jr., Lancaster, and Rickie L. Sitler, Wrightsville, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 123,739, March 12, 1971. This application Aug. 10, 1972, Ser. No. 279,501
Int. Cl. B32b *3/26, 7/00*
U.S. Cl. 161—161 **2 Claims**



A thick, foamed plastic slab having a smooth surface, a densified core, and rounded edges is produced by extruding foamable, substantially unplasticized poly(vinyl chloride) in the form of a tube into a region of lower pressure, immediately cooling the outer surface of the tube while allowing entrapped gases to cause formation of a rough-textured inner surface thereon and then compressing the tube at right angles to the direction of extrusion.

3,790,437

POLYVINYL ALCOHOL FIBER REINFORCED POLYURETHANE COMPOSITIONS AND PRODUCTS THEREFROM

John S. Haley, Lake Junaluska; Jerry W. Cooper, and Arthur D. Logan, both of Waynesville, all of N.C., assignors to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 71,237, Sept. 10, 1970, abandoned. This application Apr. 20, 1972, Ser. No. 245,911
Int. Cl. B32b *5/02, 5/16*
U.S. Cl. 161—170 **7 Claims**

A reinforced composition of improved physical properties is obtained by incorporating polyvinyl alcohol fibers or particles into curable liquid urethane prepolymers or thermoplastic urethane polymers. A strong chemical adhesion is obtained between the polyvinyl alcohol and urethane.

3,790,438

RIBBON-REINFORCED COMPOSITES

Thomas B. Lewis, and Lawrence E. Nielsen, both of Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1971, Ser. No. 213,116
Int. Cl. D02g *3/00*
U.S. Cl. 161—172 **19 Claims**

Ribbon reinforced composites comprising (a) a strain-hardenable polymer having a tensile elongation to break greater than 25 percent, and a lap shear strength characteristic of a good adhesive material; and

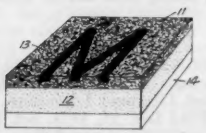
(b) between about 20 and 90 volume percent of a ribbon reinforcement having a tensile modular ratio greater than 5. One feature of the above composites pertains to the particular placement of the ribbons with respect to one another.

3,790,439

PRINTABLE, HEAT-BONDABLE SHEET MATERIAL

James D. La Perre, Troy, Wis.; James F. Dyrud, North St. Paul, and Thomas W. Zosel, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 28, 1971, Ser. No. 138,216
Int. Cl. C09j *7/02, 7/00*
U.S. Cl. 161—167 **6 Claims**



A laminated sheet material comprising (1) a porous, printable thermoplastic polymeric layer and (2) a heatactivated adhesive layer has particular utility in preparing call number

labels for attachment to the spines of books. The physical properties of the two layers are interrelated, and the heat which activates the adhesive during application of the label also indelibly seals the indicia in the printable layer.

3,790,440

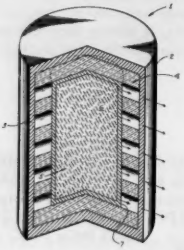
RADIOISOTOPE FUEL MATERIAL AND METHOD

Vahe Keshishian, Sherman Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 815,131, April 10, 1969, which is a continuation-in-part of Ser. No. 687,945, Oct. 25, 1967, which is a division of Ser. No. 464,702, June 17, 1965, Pat. No. 3,515,875. This application Jan. 13, 1971, Ser. No. 106,071. The portion of the term of this patent subsequent to June 2, 1987, has been disclaimed.

Int. Cl. C01g *56/00*

U.S. Cl. 252—301.1 R **14 Claims**



A primary alpha-particle-emitting radioactive fuel material and a method for preparing it so that secondary neutron generation by an alpha-neutron reaction is substantially reduced. Those individual isotopes of oxygen, carbon, nitrogen, silicon, and chlorine which have a threshold for the alpha-neutron reaction greater than the maximum energy of the emitted alpha particles are selected for combination with the alpha-particle-emitting radioactive isotope to give the desired oxides, carbides, nitrides, silicides, and oxychlorides.

3,790,441

BINDERS FOR GLASS FIBER INSULATION

Ronald James Ashall, Wigan, England, assignor to Fibreglass Limited, Liverpool, Lancashire, England

No Drawing. Filed Dec. 15, 1971, Ser. No. 208,396

Claims priority, application Great Britain, July 13, 1971, 32,877/71

Int. Cl. C08g *37/08;* **C08h** *15/00*

U.S. Cl. 161—198 **12 Claims**

A binder composition for bonding together glass comprises a resin of a phenol-formaldehyde polymer, and urea and sodium lignosulfonate as binder setting modifying additives such that by varying the relative proportions of urea and sodium lignosulfonate added, a predetermined setting time can be achieved.

3,790,442

BINDERS FOR GLASS FIBER INSULATION

Ronald James Ashall, Wigan, England, assignor to Fibreglass Limited, Liverpool, Lancashire, England

No Drawing Filed Dec. 15, 1971, Ser. No. 208,400

Claims priority, application Great Britain, Dec. 19, 1970, 60,195/70; Jan. 29, 1971, 3,475/71; July 13, 1971, 32,877/71

Int. Cl. C08g *37/08;* **C08h** *15/00*

U.S. Cl. 161—198 **11 Claims**

A binder composition for bonding together glass fibers comprises a resin of a phenol formaldehyde polymer and two setting modifying additives, namely urea and either calcium, magnesium or ammonium lignosulfonate so that by controlling the amount of urea relative to the lignosulfonate added to form the binder a desired setting time can be achieved.

3,790,443

HYDROXYMETHYLAMINO NITRILE SALTS FOR QUENCHING THE FLUORESCENCE OF OPTICAL BRIGHTENING AGENTS

William M. Reif, 300 Broadway, Dobbs Ferry, N.Y. 10522, and Robert B. Lauder, 94 Brookmere Drive, Fairfield, Conn. 06430

No Drawing. Filed Apr. 27, 1972, Ser. No. 248,202

Int. Cl. D21h *3/52*

U.S. Cl. 162—158 **10 Claims**

A water soluble hydroxymethylamino nitrile salt is applied directly as a dry powder to papermaking materials to quench the fluorescence of optical brightening agents present in the papermaking materials.

3,790,444

PROCESS FOR PREPARING DIKETOGLUCONIC ACID

Shunichiro Oga, Kiyoshi Sato, Katsumi Imada, and Kazuo Asano, Osaka, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

No Drawing. Filed Mar. 9, 1972, Ser. No. 233,293

Claims priority, application Japan, Mar. 9, 1971, 46/12,643

Int. Cl. C12b *1/00*

U.S. Cl. 195—47 **6 Claims**

2,5-diketogluconic acid is produced in a high yield by the cultivation of newly isolated *Acetobacter fragum* n. sp.

3,790,445

PRODUCTION OF OPTICALLY ACTIVE ANTIPODES

Heinz Gibian and Klaus Kieslich, Berlin, Germany, Hans-Joachim Koch, Caracas, Venezuela, Horst Kosmol, Clemens Rufer, and Eberhard Schroder, Berlin, Germany, and Rosemarie Walsh, nee Vossing, Glendale, Calif., assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

No Drawing. Continuation-in-part of application Ser. No. 578,996, Sept. 13, 1966, now Patent No. 3,562,112. This application Nov. 20, 1970, Ser. No. 91,552

Claims priority, application Germany, Sept. 14, 1965, Sch 37,715

Int. Cl. C07c *167/00;* **C12d** *13/00*

U.S. Cl. 195—51 R **11 Claims**

In a process for the production of optically active compounds, such as intermediates for the production of steroid hormones, in which an optically inactive compound of the formula

wherein C_1 is a symmetric carbon atom and the two Z groups are identical aliphatic groups joined together, each of which bears a keto group, and Y is the remainder of the molecule, is subjected to a microbiological enzyme system to produce an optically active antipode of the formula

wherein Y and Z have the values given above, C_a is the asymmetrical carbon atom corresponding to C_1 and Z' is a ligand otherwise corresponding to Z bearing a hydroxy rather than a keto group, the improvement which comprises employing a microorganism selected from the group consisting of *Aspergillus ochraceus, Bacillus esterificans, Bacillus thuringiensis* and *Saccharomyces uvarum.*

3,790,446

CYTOPHAGA ISOAMYLASE

Zeenat Gunja-Smith, Miami, Fla., assignor to Research Corporation, New York, N.Y.

No Drawing. Filed Oct. 7, 1971, Ser. No. 187,318

Int. Cl. C12d *7/02*

U.S. Cl. 195—66 R **10 Claims**

Isoamylase enzyme which will debranch polysaccharides having α-1→6-linked branches, for example glycogen and amylopectin, is recovered from an enzyme system derived from a species of the genus Cytophaga deposited in the National Collection of Industrial Bacteria in Aberdeen, Scotland, under number NCIB 9497. This Cytophaga isoamylase has the following identifying characteristics:

(a) an optimum activity pH of 5.5;
(b) a molecular weight of the order of 120,000;
(c) an isoelectric point between 5.0 and 5.5;
(d) inactivation by ethylenediamine tetraacetate;
(e) non-inactivation by tris-2-amino-2-hydroxymethyl-1,3-propanediol or p-CMB (p-chloromercuribenzoate).

3,790,447

STREPTOCOCCI DIAGNOSTIC METHOD

Arthur Atsunobu Hirata, Waukegan, and William Franklin Boley, Lake Villa, Ill, assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed July 5, 1972, Ser. No. 268,967

Int. Cl. C12k *1/04*

U.S. Cl. 195—103.5 R **3 Claims**

A method of detecting Streptococcal organisms, especially Group A, β-hemolytic Streptococci, is provided wherein separate smears on microscope slides comprising negative control and positive control organisms are treated with antibody conjugated to peroxidase, and the slides then compared under the microscope, after dyeing with enzyme substrates to determine the presence of Group A Streptococci.

3,790,448

METHOD OF PURIFYING WASTE FLUID

William J. Didycz, Whitehall Borough, and Donald Glassman, Mount Lebanon Township, both of Allegheny County, Pa., assignors to United States Steel Corporation

Filed Mar. 3, 1971, Ser. No. 120,540

Int. Cl. B01d *3/06*; C10b *39/08*

U.S. Cl. 201—39 **13 Claims**

A frontward flow and backward flow method of and apparatus for purifying waste fluid containing waste water and corrosive salts with high temperature steam from a continuous coke quenching apparatus to produce substantially pure salt free condensate are disclosed.

(A) One method of purifying waste fluid, containing waste water and corrosive salts produced in a coke producing apparatus and normally utilized to quench coke in a coke quenching apparatus, with waste steam from the coke quenching apparatus to produce substantially salt free condensate, comprises the steps of:

(a) heating the waste fluid in heat exchange relationship with the steam to a first predetermined temperature at a first predetermined pressure;
(b) condensing the high temperature steam to form substantially salt free condensate;
(c) vaporizing the heated waste fluid at the first predetermined temperature at the first predetermined pressure to vaporize a portion of the waste fluid and to concentrate the corrosive salts to form a concentrate, the first predetermined pressure being lower than the pressure of the waste steam from the coke quenching apparatus;
(d) condensing the heated vaporized portion of the waste fluid to form substantially salt free condensate; and
(e) utilizing the substantially salt free condensate in an industrial application, thereby eliminating the disposal of the waste fluid and the contamination of the atmosphere with the waste fluid if the waste fluid were employed to quench the coke in the coke quenching apparatus, and utilizing the waste steam for a useful purpose.

3,790,449

METHOD OF AND APPARATUS FOR CONTINUOUS ELECTROCHEMICAL METERING OF SUBSTANCE CONCENTRATIONS IN GASEOUS MEDIA, WITH ELECTROLYTE RECIRCULATION

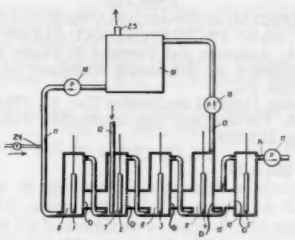
Jiri Novak, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie ved, Prague, Czechoslovakia

Filed June 12, 1972, Ser. No. 262,053

Claims priority, application Czechoslovakia, June 10, 1971, 4,251/71

Int. Cl. G01n *27/46*

U.S. Cl. 204—1 T **5 Claims**



Method of and apparatus for continuous electrochemical metering of concentrations of or analyzing noxious substances, such as sulphur dioxide, hydrogen sulphide, halogens, or ozone, in gaseous media. An electrolyte solution is drawn from a storage tank and forced successively through a metering system of electrode cells with at least one indicating electrode and a reference electrode cell, the reference electrode cell forming the last downstream stage of said system, whereby harmful products arising in electrode reactions are made ineffective by electrochemical reactions, the degree of concentration of said products being proportional to the sum of the currents flowing through said metering system. A major portion of said electrolyte solution is reintroduced into the storage tank to be repeatedly recirculated; a minor portion of said electrolyte solution is passed through said reference electrode cell. The said electrolyte solution is an aqueous solution of sulphuric acid which is saturated with elemental iodine during its passage between the storage tank and the metering system.

3,790,450
ORGANIC COATING PROCESS
Herman S. Bloch, Des Plaines, and James J. Louvar, Niles, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Dec. 21, 1972, Ser. No. 317,327
Int. Cl. C23b 5/00, 9/00
U.S. Cl. 204—14 N 10 Claims

An electrochemical method of depositing a high-melting, impervious organic coating upon a metal substrate utilizing a novel electrolyte comprising a lower aliphatic acid, an aromatic compound and a Group III–A halide.

3,790,451
ELECTRODEPOSITION OF COPPER FROM SULFUR-FREE CYANIDE ELECTROLYTES USING PERIODIC REVERSE CURRENT
Lavern M. Weisenberger, Walled Lake, and Julio L. Biora, Highland Park, Mich., assignors to The Richardson Chemical Company (Allied-Kelite Products Division), Baltimore, Md.
Filed Aug. 29, 1969, Ser. No. 854,094
Int. Cl. C23b 5/48
U.S. Cl. 204—15 14 Claims

A process for electroplating copper on a base member comprising applying to the member an essentially sulfur-free aqueous alkaline cyanide plating bath comprising a source of copper, an acetylenic alcohol, a complexing agent and a hydroxy acid. Current is caused to flow through the member while in contact with the plating bath for a period of 20–60 seconds to electroplate copper on said member. Thereafter a deplating electric current is caused to flow through said member for a period of 6–20 seconds to deplate a part of the copper plated on the member. Alternate plating and deplating cycles are continued until a desired thickness of copper has been deposited on the member.

3,790,452
ANODIZED SILICON-MANGANESE ALUMINUM BASE ARCHITECTURAL ALLOY
William A. Anderson and Edmund C. Franz, Pittsburgh, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
No Drawing. Original application Dec. 17, 1969, Ser. No. 886,010. Divided and this application Feb. 3, 1972, Ser. No. 223,379
Int. Cl. C23b 9/02
U.S. Cl. 204—29 7 Claims

An aluminum base alloy containing in percent by weight 3.5–6.5 silicon, 0.3–0.65 manganese, 0.1–0.7 iron, a maximum of 0.3 copper, a maximum of 0.1 magnesium, and a maximum of 0.1 titanium, with a maximum total of other elements 0.15%, and no more than 0.05% of any one of these other elements. This alloy is colorable by anodization to an attractive slate-gray.

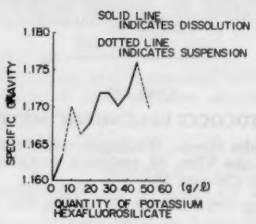
3,790,453
CORROSION PROTECTED ANODIZED ALUMINUM SURFACES
John L. Wanamaker, Burbank, Kenneth E. Weber, Los Angeles, and Geraldine M. Hoch, Chatsworth, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.
No Drawing. Filed Mar. 22, 1971, Ser. No. 126,932
Int. Cl. C23b 9/02; C23f 17/00
U.S. Cl. 204—35 N 12 Claims

An aluminum surface can be protected against corrosion by initially anodizing such a surface so as to place upon it an oxide surface film and then sealing such a surface covering by first locating cobalt ions within it and then subsequently exposing such cobalt ions in the surface covering to chromate ions in order to react the cobalt and chromate ions to produce a cobaltous chromate composition within the oxide surface. Such a composition is considered to be a mixture of cobaltous oxychromate compounds.

3,790,454
ELECTRODEPOSITION OF SPONGE NICKEL
Ian H. S. Henderson, Ottawa, Ontario, and Stephan George Ladan, Edmonton, Alberta, Canada, assignors to Her Majesty the Queen in Right of Canada as represented by the Minister of National Defence
No Drawing. Continuation of abandoned application Ser. No. 625,945, Mar. 27, 1967. This application Jan. 22, 1971, Ser. No. 109,022
Int. Cl. C23b 5/08
U.S. Cl. 204—49 8 Claims

Sponge nickel is electrolytically deposited from a conventional nickel plating bath to which finely divided low density nickel powder has been added.

3,790,455
CHROMIUM PLATING BATH
Eigi Kaneko and Masa Nakajima, both of 21–8, 2-chome, Shimomaruko, Tokyo, Japan
Continuation-in-part of abandoned application Ser. No. 626,406, Mar. 28, 1967. This application Jan. 22, 1970, Ser. No. 4,810
Int. Cl. C23b 5/06
U.S. Cl. 204—51 8 Claims



A chromium plating bath utilized to form a chromium plated layer on the surface of an article to be plated comprises an aqueous solution of chromium trioxide, and fluorosilicate dissolved in the aqueous solution in amounts ranging from 20 to 45 grams per one liter of the solution. Direct current is passed between an anode electrode made of metal, such as lead, and a cathode electrode consisting of the article to be plated, which are immersed in the plating bath.

3,790,456
METHOD OF EXTRACTING AND RECOVERING CHROMIUM VALUES FROM CHROMITE ORE
Charles Patrick Bruen, Bernardsville, N.J., and Christian Albert Wamser, Camillus, and Thomas Richard Morgan, Solvay, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Feb. 16, 1972, Ser. No. 226,866
Int. Cl. B01k 3/00; C01b 13/14; C22b 3/00
U.S. Cl. 204—61 14 Claims

A method of extracting chromium values from chromite ore by digesting the ore with a molten bisulfate, separating the insolubles and electrolyzing the digest fluid to yield an immiscible phase consisting of an oxidized chromium product.

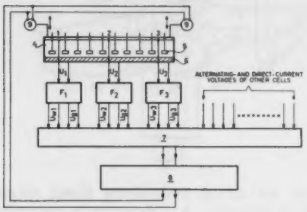
Preliminary thermal oxidation of the chrome ore prior to the digestion step increases the dissolution rate and efficiency in the molten bisulfate.

3,790,457

PROCESS FOR ADJUSTING THE ELECTRODE DISTANCE IN AN ELECTROLYTIC CELL WITH FLOWING MERCURY CATHODE

Gerhard Quietzsch, Frankfurt am Main, Bernd Greiner, Oberdorfelden, Helmut Hund, Schneidhain, Taunus, Harald Nottebohm, Frankfurt am Main, and Lothar Pelz, Oberroden, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Dec. 18, 1972, Ser. No. 316,118
Claims priority, application Germany, Dec. 18, 1971, P 21 62 962.9
Int. Cl. C01d *1/14;* B23p *1/12*
U.S. Cl. 204—99 1 Claim



The electrode distance in electrolysis cells with flowing mercury cathode is adjusted, for example in the alkali metal chloride electrolysis. The anodes or groups of anodes are brought close to the cathode until the ratio of the variation of the amplitude of the characteristic alternating voltage or current occurring with small electrode distances to the variation of the direct voltage or current in the electrolysis cell in the same time interval has reached a predetermined value.

3,790,458

METHOD OF ELECTROCHEMICAL PROCESSING OF MANGANESE ORES AND THEIR CONCENTRATION WASTES

Nazi Vladimirovna Demuria, ulitsa Grishashvili 42, and Rafael Ilich Agladze, prospekt Plekhanova 96/90, kv. 1, both of Tbilisi, U.S.S.R.

Filed Oct. 18, 1972, Ser. No. 298,629
Int. Cl. B01k *1/00*
U.S. Cl. 204—96 6 Claims

A method of electrochemical processing of manganese ores and their concentration wastes comprising the leaching of said manganese-containing starting material with an aqueous acid solution with the formation of a manganese salt. Said solution of a manganese salt is separated from waste rock and subjected to electrolysis in a membrane-type electrolyzer. The electrolysis is performed in the presence in the solution, in addition to a manganese salt, of a salt of an alkali or alkaline-earth metal at a temperature of 80–100° C. in the anode space and at a ratio between the cathodic and anodic current densities of at least 1.2. Upon the electrolysis there are formed: hydrogen—at the cathode and manganous hydroxide and alkaline catholyte in the cathode space, as well as manganese dioxide at the anode and anolyte comprising an acid and a salt of an alkali or alkali-earth metal in the anode space. Waste electrolyte—anolyte—is fed into the stage of leaching the manganese-containing starting material.

The method according to the invention allows to perform the electrolysis in such a way that both anodic and cathodic processes are utilized for precipitation of manganese from the solution in the form of concentrates with minimum power consumption.

3,790,459

PROCESS FOR REMOVING HYDROGEN SILANES FROM CHLOROSILANES

Hans-Joachim Kotzsch, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

No Drawing. Filed Sept. 28, 1970, Ser. No. 76,253
Claims priority, application Germany, Sept. 27, 1969, P 19 48 911.3
Int. Cl. B01j *1/10;* C01b *33/08*
U.S. Cl. 204—157.1 8 Claims

Purification of trichlorosilane compositions which also contain higher hydrogen content silanes and may further contain tetrachlorosilane by admixing and reacting the composition with elemental chlorine at −30° C. to 300° C. for a time sufficient to convert substantially all of said higher-hydrogen silanes to tri- or tetrachlorosilane, and then recovering the trichlorosilane, possibly by distillation.

3,790,460

CARBON MONOXIDE COPOLYMERS

Lester Weintraub, Bronx, N.Y., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Continuation of application Ser. No. 826,078, May 13, 1969, which is a continuation of application Ser. No. 502,286, Oct. 22, 1965. This application July 13, 1970, Ser. No. 56,188
Int. Cl. C08f *1/18, 13/04*
U.S. Cl. 204—159.23 3 Claims

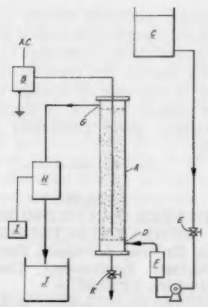
A vinyl halide, such as vinyl fluoride and vinyl chloride, and carbon monoxide are copolymerized in the simultaneous presence of a free-radical-producing compound and ultra-violet light, most advantageously at a polymerization temperature of 50° to 75° C., to produce a copolymer having a carbon monoxide content of more than 3% by weight and an intrinsic viscosity of at least 1 dl./g.

3,790,461

SEPARATION OF A LIQUID CONTAINING CHARGED PARTICLES OR/AND POLARIZABLE MOLECULES

George C. Yeh, Willistown Township, Chester County, Pa. (Smedley Drive, R.D. 1, Newtown Square, Pa. 19073)

Filed May 20, 1971, Ser. No. 145,527
Int. Cl. B01k *5/00*
U.S. Cl. 204—180 R 10 Claims



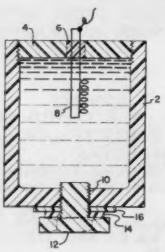
When a liquid containing charged particles, such as ions, electrolytes, free radicals and colloids or/and molecules having polar or/and polarizable properties is brought into contact with an electrostatically charged surface, a double layer of said charged particles or/and

said molecules may be formed at said surface. Separation of said charged particles or/and said molecules from said liquid can be accomplished if said liquid in the bulk is replaced from said electrostatically charged surface, after the contacting.

3,790,462
PROCESS FOR THE PREPARATION OF 1,1,1-TRIFLUORO-2-CHLORO-2-BROMOETHANE
Neithart Schultz, Eichsel, Hans-Joachim Vahlensieck, Wehr, and Peter Martens, Rheinfelden, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany
No Drawing. Filed Aug. 30, 1972, Ser. No. 284,825
Claims priority, application Germany, Sept. 3, 1971, P 21 44 160.1
Int. Cl. B01j *1/10*
U.S. Cl. 204—163 R **8 Claims**

A process for the preparation of 1,1,1-trifluoro-2-chloro-2-bromoethane in the gas phase at a temperature between 150 and 270° C. in the presence of a source of molecular chlorine under irradiation by light rays having a wave length between 2350 and 3800 angstroms.

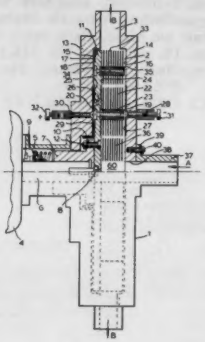
3,790,463
pH REFERENCE ELECTRODE
Arthur E. Gealt, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Aug. 30, 1972, Ser. No. 285,014
Int. Cl. G01n *27/30*
U.S. Cl. 204—195 F **10 Claims**



A pH reference electrode having a liquid junction formed by adjacent separable structural electrode elements having different coefficients of thermal expansion whereby to automatically change the cross-sectional area of the liquid junction in response to change in environmental temperature to control the flow of electrolyte out of the reference electrode, while facilitating cleaning of the liquid junction.

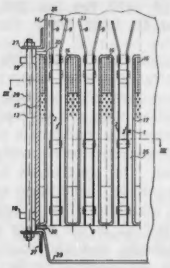
3,790,464
ELECTROLYZER INCLUDING ROTATABLE BIPOLAR ELECTRODES
Bruce Bousfield Greaves, Liverpool, England, assignor to The Cumberland Engineering Company Limited, Bootle, Lancashire, England
Filed May 30, 1972, Ser. No. 257,519
Int. Cl. C23b *5/68*
U.S. Cl. 204—212 **8 Claims**

The present invention comprises an electrolytic cell having a pair of terminal electrodes located within a chamber and adapted to be connected to the poles of a D.C. source. A plurality of "bipolar electrodes" are located between the terminal electrodes and are arranged to be rotatable about an axis through their centers. The electrolyte is fed to the cell at radially inner portions of the cell and withdrawn at the periphery of the cell, such that electrolyte flow is radially outward through the cell. Due to the rotation of the bipolar electrodes rela-



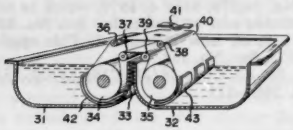
tive to the chamber and to electrolyte passing through the cell, the tendency for solid products of the elecrolysis process to accumulate on the electrodes is considerably reduced.

3,790,465
ELECTROLYTIC CELL INCLUDING VERTICAL HOLLOW ANODES WITH DEFLECTOR PANELS DIVERGING UPWARDLY FROM EACH ANODE
Umberto Giacopelli, Rosignano Solvay, Livorno, Italy, assignor to Solvay & Cie, Brussels, Belgium
Filed Dec. 6, 1972, Ser. No. 312,706
Claims priority, application France, Dec. 6, 1971, 7143789
Int. Cl. B01k *3/10*
U.S. Cl. 204—266 **9 Claims**



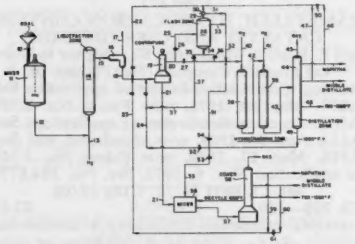
Anodes for electrolysis cells for producing a gas by electrolysis comprise vertically disposed hollow metal boxes open at their lower and upper ends and having two opposite parallel metal walls arranged facing one another. These walls are surmounted by two deflector panels which incline outwardly away from one another so as to diverge upwardly. The deflector panels may be integral with the walls or may be separate members secured to the upper portions of the walls.

3,790,466
CLEANING LIQUID PURIFICATION DEVICE FOR USE IN WET-TYPE ELECTROSTATIC PHOTOGRAPHY
Hideaki Akiyama, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed May 16, 1969, Ser. No. 825,226
Claims priority, application Japan, May 21, 1968, 43/34,207, 43/34,208
The portion of the term of the patent subsequent to Feb. 5, 1990, has been disclaimed
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—300 3 Claims



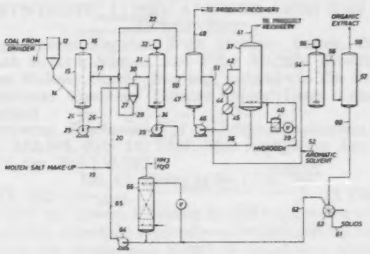
A cleaning liquid purification device for use in wet-type electrostatic photography. A container having cleaning fluid therein acts as a first electrode. An adjacent container having developing liquid therein acts as an opposing electrode, and an endless belt passing therebetween has the same polarity as the developing liquid container. Passage of the belt picks up excess toner from the cleaning liquid container for dispersal in the developing liquid container.

3,790,467
COAL LIQUEFACTION SOLIDS REMOVAL
Robert J. Fiocco, Summit, N.J., and Edward L. Wilson, Baytown, Tex., assignors to Esso Research and Engineering Company
Continuation-in-part of application Ser. No. 67,457, Aug. 27, 1970, now Patent No. 3,687,837. This application Apr. 24, 1972, Ser. No. 246,725
The portion of the term of the patent subsequent to Jan. 29, 1989, has been disclaimed
Int. Cl. C10g *1/04*
U.S. Cl. 208—8 12 Claims



Solid residues are more effectively separated from a coal extract enriched solvent of a coal liquefaction product, in a solids-liquids separation zone in which solids size is a separation parameter, by adding to the coal liquefaction product a coal extract liquid derived from the coal liquefaction product and containing at least 20 volume percent of materials boiling below about 400° F. or at least 20 volume percent of materials boiling above about 1000° F.

3,790,468
HYDROCRACKING OF COAL IN MOLTEN ZINC IODIDE
Rene A. Loth, Spring, Tex., assignor to Shell Oil Company
Filed Mar. 16, 1973, Ser. No. 342,112
Int. Cl. C10g *1/06*
U.S. Cl. 208—10 9 Claims

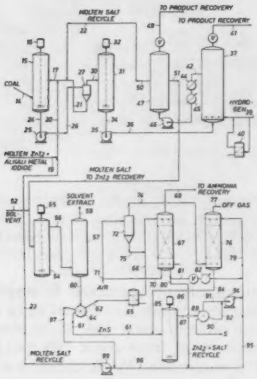


Coal is continuously hydrocracked in suspension in a continuous-phase molten salt predominating in zinc iodide, at a temperature of from about 300° C. to about 500° C. and under a pressure of from about 200 p.s.i.g. to about 3000 p.s.i.g. The molten zinc iodide contains a substantial proportion of alkali metal iodide as a melting point depressant, sufficient to lower the melting point from about 446° C., the normal melting point of zinc iodide, to substantially below 350° C. The molten zinc iodide catalyst also contains ammonia, ammonium iodide and water, in small proportions, resulting from hydrocracking the coal, all of which are also melting point depressants for zinc iodide. The slurry of coal in the molten catalyst system is prepared by first slurrying ground coal in at least 12 to about 25-fold proportions by weight molten iodide salt mixture predominating in zinc iodide and containing alkali metal iodide. The resulting slurry of coal in the molten salt mixture is then concentrated by separating a portion, at least one-third, of the molten salt mixture, to provide a still pumpable slurry of coal in molten salt, which is the charge to the hydrocracking zone. The separated excess molten salt is recycled to the primary slurrying operation to provide a portion of the molten salt for slurrying the coal. The molten salt mixture withdrawn from the hydrocracking operation is separated from volatile and normally liquid products of the reaction, and a major proportion thereof is recycled to the primary slurrying step. A minor proportion of the molten salt mixture is extracted with an aromatic solvent to remove resulting tar-like material and then filtered to remove solids, after which the separated molten salt is recycled to the primary slurrying operation.

3,790,469
HYDROCRACKING COAL IN MOLTEN ZINC IODIDE
Rene A. Loth, Spring, and Milton M. Wald, Houston, Tex., assignors to Shell Oil Company
Filed Mar. 16, 1973, Ser. No. 342,113
Int. Cl. C10g *1/06*
U.S. Cl. 208—10 6 Claims

Coal is slurried in a molten salt mixture predominating in zinc iodide and the coal is hydrocracked at a tempera-

ture of about 300°–500° C. and at a pressure of about 200–3000 p.s.i.g. in the presence of hydrogen. The molten salt mixture contains a substantial proportion of alkali or alkaline earth metal iodide as a melting point depressant, sufficient to lower the melting point from about 446° C., the normal melting point of zinc iodide, to substantially below 350° C. The hydrocracking converts nitrogen and oxygen in the coal to ammonia and water, respectively, the ammonia being converted in part to ammonium iodide. The generated water, ammonia and ammonium iodide all function as melting point depressants for zinc iodide. A major portion of the molten salt mixture, containing coal residue, including tar and ash, is recycled to the hydrocracking process. A minor proportion of the resulting molten salt mixture from hydrocracking is separated as a slip-stream and processed for recovery of the molten salt mixture thereof, and conversion of zinc sulfide and ammonium iodide formed from hydrocracking the coal, to recover the zinc and iodide contents thereof as zinc iodide, which is also recycled to the coal slurry operation.



3,790,470

PRODUCTION OF LUBRICATING OILS

Theodore C. Mead, Port Arthur, Billy H. Cummins, Nederland, and Richard L. Coleman, Port Arthur, Tex., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 6, 1972, Ser. No. 312,440

Int. Cl. C10g *13/00*

U.S. Cl. 208—58 **9 Claims**

Lubricating oils of improved viscosity index and improved stability to ultraviolet light are prepared by a procedure involving hydrocracking, solvent extraction, hydrogenation of the aromatic-rich extract and reblending.

3,790,471

CONVERSION WITH ZSM–5 FAMILY OF CRYSTALLINE ALUMINOSILICATE ZEOLITES

Robert J. Argauer, Kensington, Md., and George R. Landolt, Audubon, N.J., assignors to Mobil Oil Corporation

No Drawing. Continuation-in-part of abandoned application Ser. No. 630,933, Apr. 14, 1967, and a division of application Ser. No. 865,472, Oct. 10, 1969, now Patent No. 3,702,886. This application May 18, 1972, Ser. No. 254,799

Int. Cl. C10g *13/02*; C01b *33/28*

U.S. Cl. 208—111 **13 Claims**

Catalytic conversion of hydrocarbons is carried out by contacting the same with a family of crystalline zeolites designated as ZSM–5 having the composition expressed as mol ratios of oxides as follows:

$$0.9 \pm M_{2/n}O : Al_2O_3 : ySiO_2 : zH_2O$$

wherein M is at least one cation having a valence n, y is at least 5 and z is between 0–40, said aluminosilicates characterized by a specific X-ray powder diffraction pattern.

3,790,472

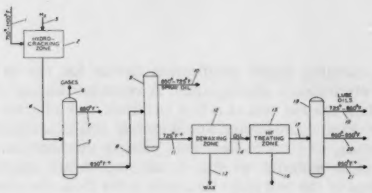
HYDROCRACKING PROCESS FOR PRODUCING LUBRICATING OILS

Robert J. White, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 260,933, June 8, 1972, which is a continuation-in-part of application Ser. No. 34,370, May 4, 1970, which in turn is a continuation-in-part of application Ser. No. 800,896, Feb. 20, 1969, all now abandoned. This application May 24, 1973, Ser. No. 363,778

Int. Cl. C01b *33/28*; C10g *13/02, 13/14*

U.S. Cl. 208—111 **9 Claims**



A process for producing lubricating oils which comprises hydrocracking in a hydrocracking zone at a temperature of 500° to 850° F. and a per-pass conversion of 20 to 90 volume percent a hydrocarbon feedstock containing a substantial amount of materials boiling above 700° F., in the presence of a hydrocracking catalyst comprising at least one hydrogenating component and a crystalline zeolitic molecular sieve cracking component selected from zeolite A, faujasite, zeolite X and zeolite Y, and further selected from components substantially in the decationized, ammonium or hydrogen form, and recovering from the hydrocracking zone a plurality of lubricating oil fractions boiling above 700° F. and having V.I.'s in the range of 90 to 120 and a V.I. spread of 10 units or less.

3,790,473

TETRAMETALLIC HYDROCARBON CONVERSION CATALYST AND USES THEREOF

Richard E. Rausch, Mundelein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 142,079, May 10, 1971, now Patent No. 3,702,294, which is a continuation-in-part of applications Ser. No. 819,114, Apr. 24, 1969, now abandoned, and Ser. No. 807,910, Mar. 17, 1969, now Patent No. 3,740,328. This application Nov. 6, 1972, Ser. No. 304,177

Int. Cl. B01j *11/12*; C10g *35/08*

U.S. Cl. 208—139 **23 Claims**

A catalytic composite comprising a combination of catalytically effective amounts of a platinum or palladium component, an iridium component, a rhenium component and a tin component with a porous carrier material is disclosed. The principal utility of this composite is in the conversion of hydrocarbons, particularly in the reforming of a gasoline fraction. A specific example of the disclosed catalytic composite is a combination of a platinum component, an iridium component, a rhenium component, a tin component, and a halogen component with an alumina carrier material in amounts sufficiently to result in

a composite containing, on an elemental basis, about 0.01 to 2 wt. percent platinum, about 0.01 to about 2 wt. percent iridium, about 0.01 to 2 wt. percent rhenium, about 0.01 to 5 wt. percent tin and about 0.1 to 3.5 wt. percent halogen.

3,790,474
METHOD OF PURIFYING OILS CONTAINING LIQUID AND SOLID IMPURITIES
James W. Moffitt, 7 Fairwood, Pleasant Ridge, Mich. 48069
No Drawing. Filed May 10, 1973, Ser. No. 358,941
Int. Cl. C10m *11/00*
U.S. Cl. 208—181 **7 Claims**

A process for removing solid and liquid impurities from used oils such as hydraulic oils, lubricating oils, quench oils, tramp oils, cutting oils and oils used in sharpening, finishing and grinding of metal tools and parts, comprising heating the oil, adding a small amount of an alkaline solution to the oil while stirring the oil, maintaining the treated oil at a heated temperature, subsequently adding an acid to the treated oil mixture while stirring the oil to thoroughly mix the acid with the oil and maintaining the treated oil in a settling container at a heated temperature for a period of at least about 10 hours in order to allow the solids and water to settle to the bottom. The purified oil which remains on top can then be withdrawn. Sodium hydroxide and sulfuric acid are preferred reactants.

3,790,475
POROUS GLASS SUPPORT MATERIAL
David L. Eaton, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Original application Mar. 27, 1972, Ser. No. 238,258. Divided and this application Mar. 30, 1973, Ser. No. 346,607
Int. Cl. B01d *15/08*
U.S. Cl. 210—31 C **2 Claims**

Porous glass support materials having two essentially distinct zones of porosity. An outer surface zone comprises an outer shell with relatively large pores of controlled diameter while an inner zone comprises a core portion having relatively smaller pores of controlled diameter. The materials are made by subjecting porous glass bodies of substantially uniform pore size to a carefully controlled alkali etching cycle in which only the outer zone of the bodies have their pores enlarged. The thus treated bodies are particularly useful as chromatographic support materials which, in use, demonstrate a desirably low height equivalent theoretical plate (HETP).

3,790,476
LATICES FOR INDUSTRIAL WASTE COAGULATION
F. Steven Spoerle, Oak Lawn, and Elmer W. Palmer, Woodridge, Ill., assignors to Nalco Chemical Company, Chicago, Ill.
No Drawing. Filed Nov. 22, 1971, Ser. No. 200,848
Int. Cl. B01d *21/02*; C02b *1/20*
U.S. Cl. 210—47 **10 Claims**

Thickening or dewatering solids from industrial wastes comprising the addition of an aqueous solution of a water-soluble vinyl addition polymer made by the inversion of a polymeric latex.

3,790,477
LATICES FOR SEWAGE COAGULATION
Ralph R. Nielsen, Chicago, and William R. Busler, Park Forest, Ill., assignors to Nalco Chemical Company, Chicago, Ill.
No Drawing. Continuation-in-part of abandoned application Ser. No. 201,398, Nov. 23, 1971. This application Feb. 2, 1972, Ser. No. 222,998
Int. Cl. B01d *21/02*; C02b *1/20*
U.S. Cl. 210—47 **8 Claims**

Thickening or dewatering solids from sewage comprising the addition of an aqueous solution of a water-soluble vinyl addition polymer made by the invention of a polymeric latex.

3,790,478
SYNTHETIC LUBRICANT FOR AERO GAS TURBINES
Stanley George Rudston, West Molesey, Surrey, Derek Clark Byford, Staines, and Peter Michael Blanchard, West Molesey, Surrey, England, assignors to The British Petroleum Company Limited, Moor Lane, London, England
No Drawing. Continuation of abandoned application Ser. No. 652,696, July 12, 1967. This application Apr. 30, 1971, Ser. No. 139,183
Int. Cl. C10m *1/34, 1/46*
U.S. Cl. 252—34 **12 Claims**

An aero gas turbine lubricant having outstanding oxidation stability, corrosion resistance and load carrying ability and good low temperature fluidity is based on a hindered ester and contains an alkylated diphenylamine and an alkylated phenyl naphthylamine as antioxidants, a copper passivator, a dispersant polymer and a neutral organic phosphate as a load-carrying additive. A lead corrosion inhibitor and a hydrolytic stability improver may also be included in the lubricant.

3,790,479
LITHIUM BASE LUBRICATING GREASE METHOD
Gordon H. Hommer, Wallingford, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.
Filed Dec. 21, 1970, Ser. No. 100,249
Int. Cl. C10m *5/14*
U.S. Cl. 252—41 **1 Claim**

A method is disclosed for the low temperature preparation of a lithium base lubricating grease having the desired properties wherein the need for either shearing or milling is eliminated. Furthermore, the resulting grease has excellent mechanical stability. This method comprises raising the top temperature of the saponified mixture to within a specified narrow temperature range. The latter is related to the aniline point of the lubricating oil in the composition whose top temperature falls within the aforementioned temperature range.

3,790,480
MINERAL OIL COMPOSITION
John B. Campbell, Hockessin, and Edward Fuller Cluff and Christos Sarafidis, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 29, 1972, Ser. No. 319,898
Int. Cl. C10m *1/18*
U.S. Cl. 252—59 **10 Claims**

A mineral oil composition comprising a neutral, nonvolatile, mineral oil base and, as a viscosity index improver, an effective amount, for example, 0.5–3 weight percent, of an essentially amorphous, oil soluble copolymer having random repeat units derived, on a weight basis with the combined weights totalling 100%,

(a) 25–55% from ethylene,
(b) 37–75% from a terminally unsaturated straight chain monoolefin having 3–12 carbon atoms,
(c) 0.1–10% from a non-conjugated diolefin having 5–18 carbon atoms and only one polymerizable double bond, and

(d) 0.1–2% from a non-conjugated diolefin having 5–18 carbon atoms and two polymerizable double bonds,

said copolymer having an inherent viscosity of 0.7–1.8 as measured on a 0.1 weight percent solution in tetrachloroethylene at 30° C. and a Wallace Plasticity of at least 16, said copolymer further characterized as exhibiting superior processability and isolability and good shear stability.

3,790,481

SYNTHETIC LUBRICANTS FOR AERO GAS TURBINES

Derek Clark Byford, Staines, and Peter Michael Blanchard, West Molesey, England, assignors to The British Petroleum Company Limited, Moor Lane, London, England

No Drawing. Continuation of abandoned application Ser. No. 652,697, July 12, 1967. This application Apr. 30, 1971, Ser. No. 139,184

Int. Cl. C10m *1/10*

U.S. Cl. 252—49.9 **9 Claims**

An aero gas turbine lubricant having outstanding thermal and oxidation stability, corrosion resistance and load-carrying ability and good low temperature fluidity is based on a hindered ester and contains an aromatic amine antioxidant, a copper passivator of the azole or salicylaldehyde semicarbazone type and a neutral phosphate and a dialkyl phosphite as load carrying additives. A lead corrosion inhibitor and a hydrolytic stability improver may also be included in the lubricant.

3,790,482

ENZYME-CONTAINING DETERGENT COMPOSITIONS

Jack D. Jones, Cincinnati, and Everett J. Collier, New Burlington, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Continuation of abandoned application Ser. No. 721,081, Apr. 12, 1968. This application June 9, 1971, Ser. No. 151,552

Int. Cl. C11d *1/14, 1/37, 7/42*

U.S. Cl. 252—525 **1 Claim**

Alkaline detergent compositions containing an organic detergent and an alkaline builder salt in a weight ratio of about 1:30 to about 4:1 and an enzymatic mixture of about 0.001 to about 10% of a *Bacillus subtilus*-derived Carlsberg subtilisin, an X-ray mutated *Bacillus subtilus*-derived subtilisin or mixture thereof and about 0.0003 to about 3% of an α-amylase. A weight ratio of alkaline protease to α-amylase of about 30:1 to about 3:1 is employed to provide detergent compositions having excellent cleaning and stain removal properties.

3,790,483

LUBRICATING OILS CONTAINING A VINYL AROMATIC, C_2 TO C_8 OLEFIN AND C_{12} TO C_{20} OLEFIN TERPOLYMER

W. R. Song, Maplewood, and Norman Jacobson, East Brunswick, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed June 28, 1972, Ser. No. 267,211

Int. Cl. C01m *1/38*

U.S. Cl. 252—59 **7 Claims**

An oil-soluble terpolymer, useful as a viscosity index improver and pour point depressant for lubricating oils, is made by a Ziegler-Natta synthesis, preferably hydrogen moderated, from monomers comprising 2 to 50 mole percent of a vinyl aromatic hydrocarbon; from 1 to 49 mole percent of a C_2–C_8 straight-chain α-olefin; and 10 to 97 mole percent of a substantially linear C_{12}–C_{20} α-olefin having not less than 9 unsubstituted methylene radicals in a straight chain following the olefinic carbon atoms. The terpolymer is amorphous in structure as determined by X-ray and differential thermal analyses, is essentially free of olefinic unsaturation and has a number average molecular weight equal to or greater than 10,000.

3,790,484

FRAGRANCE-IMPARTING LAUNDERING COMPOSITION

Rhio H. Blair, Santa Ana, Calif., assignor to Edwin O. Blalock, Los Angeles, Calif.

No Drawing. Filed Jan. 18, 1972, Ser. No. 218,827

Int. Cl. C11d *3/50*

U.S. Cl. 252—89 **2 Claims**

Residual fragrance is imparted to laundered fabric articles by adding to such articles in course of laundering and during or at the inception of final rinse an aqueous composition comprising a fragrant oil, a cationic agent such as a dialkyl fatty quaternary ammonium halide, an organic amine base, and a non-ionic detergent.

3,790,485

PROCESS FOR PRODUCING ELECTROPHOTOGRAPHIC LIQUID DEVELOPER

Masamichi Sato and Yasuo Tamai, Asaka, Japan, assignors to Xerox Corporation, Stamford, Conn.

No Drawing. Filed Feb. 3, 1972, Ser. No. 223,366

Int. Cl. G03g *9/04*

U.S. Cl. 252—62.1 **8 Claims**

A process for producing electrophotographic liquid developer containing finely divided powdered polypeptide polymeric particles which comprise preparing an intimate mixture of the said polypeptide material and a ferromagnetic powder material in an aqueous solution subjecting said mixture to a wet process crushing in a carrier liquid and, after said mixture is dried, removing said ferromagnetic powder from said mixture by means of a magnetic field.

3,790,486

THERMAL CATALYTIC CHEMICAL REACTION OF NON-NEWTONIAN FLUIDS

Alvin R. Saltzman, Bradley Beach, N.J., and Bruno T. Plizak, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Oct. 28, 1971, Ser. No. 193,549

Int. Cl. C09k *3/02*

U.S. Cl. 252—77 **5 Claims**

Non-Newtonian fluids suitable for use as a coolant comprise various types of collagen reactant materials prepared in aqueous solution with catalytic materials. The fluids exhibit thermal catalytic chemical reaction when subjected to heat. The fluids in addition have a viscosity which is time dependent and subject to change without the necessity of heat.

3,790,487

EROSION-INHIBITED FUNCTIONAL FLUIDS

Merwyn L. Burrous, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Nov. 5, 1971, Ser. No. 196,179

Int. Cl. C09k *3/02*

U.S. Cl. 252—78 **13 Claims**

The addition of a small amount of phosphonium or ammonium salt of the formula

$$(R)_nNH^+_{4-n}X^- \text{ or } (R)_nPH^+_{4-n}X^-$$

where X^- is halide or acetate, R is C_1–C_{50} hydrocarbyl which may be the same or different, and n is an integer from 0 to 4, to an energy-transmitting phosphate ester based functional fluid severely reduces the streaming current of the fluid. The streaming current is associated with erosion of control valves in the fluid-carrying system.

3,790,488

CLEANING COMPOSITION

Hirokazu Iino, 4/40 Kasumi-cho, Nishinomiya, Japan

No Drawing. Filed Jan. 2, 1973, Ser. No. 320,477

Int. Cl. C11d *3/20*

U.S. Cl. 252—89 **13 Claims**

A cleaning composition comprising an aqueous medium having dispersed therein a 7:3 to 3:7 weight ratio mixture

of a polar high molecular weight substance and a rubber, the concentration of said mixture being in the range of 10 to 60% by weight, based on the weight of the composition, and said rubber being at least one species selected from the group consisting of natural rubber, polybutadiene rubber and styrene-butadiene rubber.

3,790,489

PAINT STRIPPING COMPOSITION

Robert H. Shoemaker, Royal Oak, and William G. Wood, Grosse Pointe Park, Mich., assignors to Kolene Corporation, Detroit, Mich.

No Drawing. Filed Dec. 1, 1971, Ser. No. 203,880

Int. Cl. C11d 7/54

U.S. Cl. 252—103 **10 Claims**

A paint stripping compound for use fused at elevated temperatures which has a caustic base of an alkali metal hydroxide, an alkali metal nitrate, an alkali metal chloride, a catalyst selected from the group of alkali metal permanganates, manganese dioxide and Cr_2O_3, and preferably an alkali metal carbonate. The compound is fused and maintained at temperature between 800 degrees F. and 900 degrees F. for stripping. Periodically the temperature is reduced to about 700 degrees F. for desludging. Preferably the material is provided as a uniform solid solution.

3,790,490

EUROPIUM AND MANGANESE ACTIVATED STRONTIUM CHLOROSILICATE PHOSPHOR

Ranajit K Datta, East Cleveland, and Thomas W. Luscher, Wickliffe, Ohio, assignors to General Electric Company

Filed Mar. 3, 1971, Ser. No. 120,511

Int. Cl. C09k 1/54

U.S. Cl. 252—301.4 F **1 Claim**

A strontium chlorosilicate phosphor, $Sr_5Si_4Cl_6O_{10}$ activated by europium and manganese is described. The phosphor produces a bright green emission when excited by 2537 and 3650 Angstrom radiation.

3,790,491

SPINNING SOLUTION COMPRISING A POLYAMIDE, POLYESTER OR POLYOLEFIN AND AN OPTICAL BRIGHTENER

Gaudenz Girell di Giovanoel, Arlesheim, Basel-Land, and Reinhard Zweidler, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Original application Nov. 19, 1969, Ser. No. 878,214, now Patent No. 3,635,959. Divided and this application July 22, 1971, Ser. No. 165,381

Int. Cl. D06l 3/12

U.S. Cl. 252—301.2 W **1 Claim**

2-4-(3-alkyl - 4 - phenyl-v-triazole) - styryl benzoxazoles and -benzothiazoles are brighteners for organic material. The compounds are obtained from the oximes of the coupling products of p-diazo-2-styrylbenzoxazoles and benzylalkylketones through splitting off water.

3,790,492

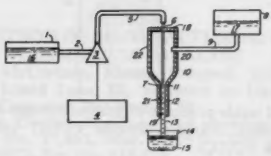
METHOD FOR PRODUCTION OF UNIFORM MICROSPHERES

Mack J. Fulwyler, Los Alamos, N. Mex., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 11, 1971, Ser. No. 123,362

Int. Cl. C09k 3/00

U.S. Cl. 252—301.1 R **1 Claim**



Uniform microspheres having any desired diameter within the range of about 2 to 40 microns are readily produced by introducing a laminar jet of a core liquid carrying material in solution or suspension within a laminar flowing sheath liquid, said core liquid jet being periodically disturbed, allowing the droplets of core liquid thus produced to remain suspended within the sheath liquid for a time sufficient for the material suspended or dissolved in said droplets to form condensed microspheres, and removing said microspheres from the sheath liquid. The variation in diameter of the microspheres is about 2%, which is near the accuracy limitation of the measuring instrumentation.

3,790,493

POST OXIDATION PROCESS FOR URANIUM DIOXIDE RICH COMPOSITIONS

Abdul G. Dada, William R. De Hollander, and Robert J. Sloat, San Jose, Calif., assignors to General Electric Company

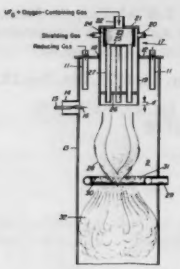
Filed Apr. 6, 1971, Ser. No. 131,685

Int. Cl. C01g 43/02

U.S. Cl. 252—301.1 R **42 Claims**

This invention presents a process for conversion of gaseous uranium hexafluoride to an oxide product of uranium by introducing to a reaction zone in the presence of an active flame maintained in the reaction zone a first gaseous reactant comprising a mixture of uranium hexafluoride and an oxygen-containing carrier gas and a second gaseous reactant comprising a reducing gas and temporarily separating the first and second gaseous reactants with a shielding gas which temporarily prevents substantial mixing and reaction between these gaseous reactants. The first and second gaseous reactants ultimately react to give a particulate uranium dioxide rich composition in the presence of residual reducing gas. An oxygen-containing gas as a third gaseous reactant is introduced at a time when the uranium hexafluoride conversion to the uranium dioxide rich composition is substantially complete. This results in oxidizing the uranium dioxide rich composition to

a higher oxide of uranium with conversion of the residual reducing gas to its oxidized form. This process is adapt-



able to yield oxide products of uranium in any state of oxidation between uranium dioxide (UO_2) and uranium tritaoctoxide (U_3O_8).

3,790,494
SILICA MODIFIED CALCIUM TUNGSTATE PHOSPHOR COMPOSITION
Francis Nathan Shaffer, Tonawanda, Pa., assignor to GTE Sylvania Incorporated
No Drawing. Continuation-in-part of abandoned application Ser. No. 30,461, Apr. 21, 1970. This application Sept. 24, 1971, Ser. No. 183,516
Int. Cl. C09k *1/28*
U.S. Cl. 252—301.5 **5 Claims**

Silica-modified, lead-activated calcium tungstate phosphor compositions having a Ca:W ratio of substantially 1 and substantially all calcium and tungsten present as calcium tungstate are disclosed wherein the phosphor contains, as a modifier, silicon dioxide in an amount sufficient to produce increased brightness to about 0.03 mole per mole of calcium tungstate and as an activator, lead in an amount sufficient to produce luminescence to about 0.03 mole per mole of calcium tungstate.

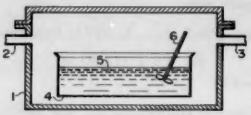
3,790,495
PROCESS FOR THE MANUFACTURE OF COLLOIDAL FIBROUS BOEHMITE
Ernst Podschus, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Jan. 31, 1972, Ser. No. 222,388
Claims priority, application Germany, Feb. 3, 1971, P 21 04 897.5
Int. Cl. B01j *13/00*
U.S. Cl. 252—313 R **6 Claims**

The present invention relates to a process for the production of colloidal fibrous boehmite [AlO(OH)] wherein active aluminum oxide having a residual water content of from 2 to 15% by weight obtained by incomplete dehydration of hydrargillite is reacted in an aqueous slurry with a monobasic organic acid to give the corresponding basic Al-salt and subsequently said basic Al-salt is subjected to hydrothermal treatment at 120–200° C. and 2–15 atmosphere pressure in an aqueous suspension having a concentration of from 2 to 20% by weight of Al_2O_3 until a colloidal fibrous boehmite solution has been formed.

3,790,496
ALKYLENE POLYAMINE POLYMERIC REACTION PRODUCT CORROSION INHIBITOR
Rudolf H. Hausler, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Sept. 30, 1971, Ser. No. 185,451
Int. Cl. C23f *11/14*
U.S. Cl. 252—392 **12 Claims**

A corrosion inhibiting composition of (1) a hydrocarbon substituted alkylene polyamine and (2) polymeric reaction product of an epihalohydrin compound and an aliphatic amine. The composition is incorporated in any substrate which contacts metal and thereby serves to inhibit corrosion of the metal.

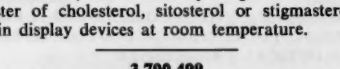
3,790,497
METHOD FOR PRODUCING WATER CONTAINING MICROCAPSULES
Hiroshi Sato, Munehiro Okumura, and Masujiro Arita, Hiroshima, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan
Filed Nov. 24, 1971, Ser. No. 201,896
Int. Cl. B01j *13/02*; B44d *1/02*
U.S. Cl. 252—316 **24 Claims**



Water containing microcapsules having wall superior in strength, thermal resistance as well as water retainability are produced by emulsifying an aqueous solution containing water soluble oxyacid salt of aluminium and other specific elements or hydrate thereof in an oily film forming liquid containing an organic acid to obtain a water-in-oil emulsion, re-emulsifying the emulsion in water containing a surface active agent to obtain an oil-in-water emulsion and hardening the film forming liquid layer of said oil-drops to form capsule wall. The microcapsules are useful for imparting antiflammability to fibers, films and so on.

3,790,498
MEMORY LIQUID CRYSTAL COMPOSITIONS
Yoshio Katagiri and Yoshio Miyata, Sendai, Japan, assignors to Kabushiki Kaisha Daini Seikosha, and Kabushiki Kaisha Seikosha, both of Tokyo, Japan
No Drawing. Filed Nov. 22, 1971, Ser. No. 201,215
Claims priority, application Japan, Dec. 28, 1970, 46/120,048
Int. Cl. C02f *1/16*
U.S. Cl. 252—408 **6 Claims**

Memory liquid crystal compositions containing from 80–95% by weight of one or more nematic crystal liquid compounds of the formula



wherein R_1 and R_2 are alkyl and alkoxy and may be the same or different, and 5–20% by weight of a carboxylic acid ester of cholesterol, sitosterol or stigmasterol are useful in display devices at room temperature.

3,790,499
CATALYST FOR THE PREPARATION OF POLYETHER-TYPE POLYMERS
Anne C. Udding, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed July 23, 1971, Ser. No. 165,705
Claims priority, application Netherlands, July 30, 1970, 7011318
Int. Cl. C08g *23/14*
U.S. Cl. 252—431 R **4 Claims**

Cyclic ethers are polymerized in the presence of a sulfur-containing catalyst formed by reacting a compound of a trivalent metal of the formula

(RO)(RO)M'—OX

with a compound of a divalent metal of the formula

YO—M—Z

wherein M' is a trivalent metal of Groups III to VI and VIII of the periodic system; M is a divalent metal or a metal-containing group, the metal of which has two free valances, of Groups I, II and IV to VIII of the periodic system; Z is an OR group or a hydrocarbylsulfinyloxy group; one of the symbols X and Y represents an R group, the other representing a hydrocarbylsulfinyl group; and R, which may be similar or dissimilar, denotes a monovalent hydrocarbyl group of 1 to 6 carbon atoms. The polymeric products are useful plastics or rubbers.

3,790,500
OXIDATIVE DEHYDROGENATION CATALYST
Darrell W. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed May 6, 1971, Ser. No. 140,968
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 **5 Claims**

Organic compounds are dehydrogenated to compounds having a higher degree of unsaturation by contacting the feedstock in the vapor phase in the presence of an oxygen-containing gas with a catalyst containing at least one of the elements nickel, cobalt or iron in association with tin, phosphorus, and arsenic together with sufficient combined oxygen to satisfy the valence requirements of the components of the catalyst. Optionally, the catalytic compositions can contain minor amounts of alkali metal such as potassium. Representative of such conversions is the oxidative dehydrogenation of butane to butenes and butadiene. The conversion products are valuable compounds particularly useful as intermediates for the preparation of polymeric materials such as synthetic rubbers and the like.

3,790,501
OXIDATIVE DEHYDROGENATION CATALYST
Darrell W. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed May 6, 1971, Ser. No. 140,967
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 **6 Claims**

Organic compounds are dehydrogenated to compounds having a higher degree of unsaturation by contacting the feedstock in the vapor phase in the presence of an oxygen-containing gas with a catalyst comprising at least one of nickel, cobalt or iron in association with tin, phosphorus and an alkali metal. Representative of such conversions is the oxidative dehydrogenation of, e.g., butane to butenes and butadiene. The conversion products are valuable compounds particularly useful as intermediates for the preparation of polymeric materials such as synthetic rubbers and the like.

3,790,502
CATALYST AND METHOD OF MANUFACTURE
Joseph W. Nemec, Rydal, Pa., and Francis W. Schlaefer, Pennsauken, N.J., assignors to Rohm & Haas Company, Philadelphia, Pa.
Application Dec. 13, 1968, Ser. No. 783,641, now Patent No. 3,637,835, which is a continuation-in-part of applications Ser. No. 555,247, June 6, 1966, now abandoned, and Ser. No. 615,880, Feb. 6, 1967, now Patent No. 3,527,716. Divided and this application Sept. 21, 1971, Ser. No. 182,347
Int. Cl. B01j *11/74*
U.S. Cl. 252—439 **11 Claims**

A catalyst, a method for its preparation, and a method of preparing catalytic cobalt molybdate, useful for the oxidation of olefins to the corresponding unsaturated aldehydes and unsaturated carboxylic acids are provided. The solid catalyst is in the form of particles, each particle comprising a fluxed mixture of (a) calcined cobalt molybdate particles, (b) a telluride of arsenic, bismuth or antimony, and (c) a molybdenum compound, such as molybdenum trioxide, which is volatile to an extent that slow migration within the pellet occurs at elevated temperatures. The volatile molybdenum compound, non-catalytic in itself, surprisingly gives a much longer productive life to the catalyst; the catalyst, in spite of the diluent, is more productive per unit of time; and the added physically soft compound does not make the particles fragile. In use, the tellurium content diminishes, and the composition of the catalyst changes slowly in other ways.

3,790,503
METHOD OF MANUFACTURING A GERMANIUM CATALYST
Daniel E. McCartney, Mount Prospect, and Roy T. Mitsche, Island Lake, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Continuation-in-part of abandoned application Ser. No. 17,862, Mar. 9, 1970. This application Mar. 27, 1972, Ser. No. 238,616
Int. Cl. B01j *11/06, 11/12*
U.S. Cl. 252—442 **12 Claims**

A method of catalyst manufacture. An aqueous solution of a weak base and a germanium compound is dissolved in an acidic alumina sol at below gelation temperature and the resulting mixture treated at an elevated temperature effecting hydrolysis of the weak base and gelation of the mixture. The weak base is preferably hexamethylenetetramine and the germanium compound is germanium dioxide or a compound hydrolyzable thereto. The product is further composited with a platinum group metal to yield an improved reforming catalyst.

3,790,504
PLATINUM-IRIDIUM-ZINC CATALYST FOR THE CONVERSION OF HYDROCARBONS
Pierre Duhaut, Le Vesinet, Jean Guillemat, Chatou, and Jean Miquel, Paris, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France
No Drawing. Filed Feb. 24, 1972, Ser. No. 229,164
Claims priority, application France, Mar. 3, 1971, 7107391
Int. Cl. B01j *11/12, 11/78;* **C10g** *35/08*
U.S. Cl. 252—466 PT **30 Claims**

An improved catalyst for carrying out such reactions as reforming, hydrogenation, dehydrogenation, isomerization, aromatization and other hydrocarbon conversions, which comprises platinum and iridium incorporated in a carrier such as alumina, silica, magnesia or alumina-silica and a critical amount of zinc or of a zinc compound.

3,790,505
LOW TEMPERATURE METHANOL SYNTHESIS CATALYST
Thomas D. Casey, Fern Creek, and George M. Chapman, Louisville, Ky., assignors to Catalysts and Chemicals, Inc., Louisville, Ky.
No Drawing. Continuation-in-part of abandoned application Ser. No. 787,234, Dec. 26, 1968. This application May 4, 1971, Ser. No. 140,244
Int. Cl. B01j *11/22*
U.S. Cl. 252—463 **12 Claims**

Until recently low temperature methanol synthesis catalysts have been virtually unknown. A zinc, copper and chromium catalyst has been used as a low temperature methanol synthesis catalyst, but alumina has been discounted as having no practical interest as an ingredient in a methanol synthesis catalyst. However, under certain conditions alumina can be used to advantage in such catalysts.

ERRATUM

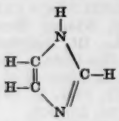
For Class 252—301 R see:
Patent No. 3,790,440

3,790,506
EPIHALOHYDRIN RUBBER VULCANIZATION

Henry C. Tillson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Oct. 26, 1972, Ser. No. 301,002
Int. Cl. C08g *43/00, 51/84*
U.S. Cl. 260—2 A 6 Claims

Epihalohydrin polymers can be rapidly cross-linked by heating with imidazole having the formula



to produce useful vulcanizates less subject to compression set.

3,790,507
PLASTIC BONE COMPOSITION

Milton Hodosh, Providence, R.I., assignor to Research Corporation, New York, N.Y.

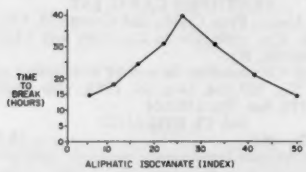
Original application Mar. 10, 1969, Ser. No. 805,400, now Patent No. 3,609,867, dated Oct. 5, 1971. Divided and this application July 6, 1970, Ser. No. 60,983
Int. Cl. C08f *45/04, 47/10*
U.S. Cl. 260—2.5 R 4 Claims

A composition comprising as its basic ingredients a mixture of grated anorganic bone and an acrylic polymer, such as polymethacrylate, for use as dental implants, as well as for implants in other parts of the body, and as a coating for metals which may be implanted in the human body for dental purposes, orthopedic protheses, neurosurgery and others.

3,790,508
LIGHT-STABLE POLYURETHANE FOAM FORMED BY REACTION OF A POLYOL AND A MIXTURE OR AROMATIC AND ALIPHATIC POLYISOCYANATES

Rocco P. Triolo, Broomall, Pa., assignor to Scott Paper Company

Filed Mar. 20, 1972, Ser. No. 236,092
Int. Cl. C08g *22/18*
U.S. Cl. 260—2.5 AT 4 Claims



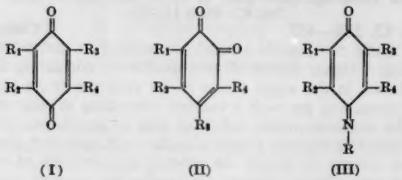
A light-stable polyurethane foam is disclosed comprising the reaction product of a polyol, an aliphatic isocyanate and an aromatic isocyanate. The reaction is carried out in the presence of a blowing agent and a catalyst.

3,790,509
PROCESS FOR THE PRODUCTION OF SYNTHETIC RESINS WHICH CONTAIN ISOCYANURATE GROUPS

Hans-Joachim Diehr, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 1, 1972, Ser. No. 258,556
Claims priority, application Germany, June 3, 1971, P 21 27 502.5
Int. Cl. C08g *33/02*
U.S. Cl. 260—2.5 AW 4 Claims

A process for the production of cellular synthetic resins which contain isocyanurate groups by polymerization of polyisocyanates in the presence of isocyanate polymerization catalysts is provided, characterized in that polymerization is carried out using a quinone of the formulae

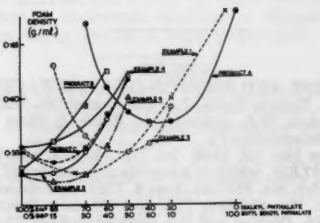


or mixtures thereof in which R_1, R_2, R_3 and R_4 are the same or different and represent hydrogen, hydrocarbon radicals containing 1 to 6 carbon atoms, halogen atoms or a nitrile radical or R_1 and R_2 and/or R_3 and R_4 represent aromatically condensed cyclic hydrocarbon radicals and R represents hydroxyl, halo or alkylamino substituted aromatic radicals containing 6 to 14 carbon atoms.

3,790,510
FOAMABLE PLASTISOL COMPOSITION CONTAINING A FOAM STABILIZER, AND FOAMED COMPOSITION OBTAINED THEREFROM

William Tait Flannigan, Kilwinning, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 13, 1972, Ser. No. 305,659
Claims priority, application Great Britain, Nov. 22, 1971, 54,120/71
Int. Cl. C08j *1/16*
U.S. Cl. 260—2.5 P 6 Claims



New organopolysiloxane pro-foamers for use in thermoplastic resin plastisols, especially vinyl chloride polymer plastisols, consisting of mono-, tri- and tetrafunctional siloxanyl units in specific ratio ranges, plastisols containing these and foams produced therefrom.

3,790,511
GUM ERASER
Fumio Horie, 22–2, 6-chome, Honkomagome, Bunkyo-ku, Tokyo-to, Japan
No Drawing. Filed July 12, 1971, Ser. No. 162,024
Claims priority, application Japan, July 13, 1970, 45/60,872; Dec. 24, 1970, 45/116,683; June 15, 1971, 46/42,120
Int. Cl. C08c *17/28;* C08d *9/04*
U.S. Cl. 260—5 3 Claims

Gum eraser of an improved quality which is composed of a base rubber material and vulcanized rubber powder particles uniformly dispersed in the base rubber material.

3,790,512
POLYAMIDE RESIN-DYE COMPOSITIONS AND METHODS OF MAKING THE SAME
Edgar R. Wagner, 11 E. 32nd St. 10016, and Charles W. Gould, 65 Central Park W. 10023, both of New York, N.Y.
No Drawing. Original application Dec. 7, 1970, Ser. No. 95,895, now Patent No. 3,743,622. Divided and this application Mar. 13, 1973, Ser. No. 340,650
Int. Cl. A61k *7/12;* C08g *51/04*
U.S. Cl. 260—14 8 Claims

A resin-dye complex for topical application to human and non-human keratinous materials and synthetic fibers, said complex being made of a polyamide-polyamine compound reacted with a heat-reactive phenolic material having appreciable alcohol solubility, said resulting resin being complexed with a dye.

3,790,513
THERMOSETTING ACRYLIC POLYMER POWDER COATING COMPOSITIONS
Claus Victorius, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Dec. 27, 1971, Ser. No. 212,738
Int. Cl. C08g *37/32*
U.S. Cl. 260—15 10 Claims

The thermosetting acrylic polymer powder coating composition comprises finely divided particles having a diameter of 1–100 microns wherein the product particles are a bend of

(A) 70–95% by weight of an acrylic polymer of methyl methacrylate, a soft constituent which is either an alkyl acrylate or an alkyl methacrylate having 2–12 carbons in the alkyl group, a hydroxy alkyl acrylate or a hydroxy alkyl methacrylate having 2–4 carbon atoms in the alkyl groups, and an α,β-ethylenically unsaturated carboxylic acid such as methacrylic acid that has at least 50% of the carboxyl groups neutralized with an aliphatic amine having a given boiling point range;
(B) 5–30% by weight of an alkylolated melamine formaldehyde;

the powder composition can contain pigments and dyes;

The novel thermosetting acrylic polymer powder coating composition is particularly useful as an exterior finish for automobiles and trucks.

3,790,514
AMPHOTERIC STRENGTHENING AGENTS FOR PAPER
Peter Economou, Bedford, Mass., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Application July 22, 1969, Ser. No. 843,838, now Patent No. 3,660,338, which is a continuation-in-part of abandoned application Ser. No. 546,214, Apr. 29, 1966. Divided and this application Apr. 24, 1972, Ser. No. 247,200
Int. Cl. C08d *9/06*
U.S. Cl. 260—17.4 ST 13 Claims

Normally liquid water-insoluble polysalt coacervates, wherein one of the component polymers is only weakly ionic, are water-soluble where they contain a sufficient amount of an ionization suppressor.

3,790,515
POURABLE, STORABLE POLYMERIZABLE LACTAM-CATALYST-ACTIVATOR MIXTURES
Heinz Jörg Rosenbaum, Krefeld-Gartenstadt, and Hans Rudolph, Krefeld-Bockum, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Mar. 8, 1972, Ser. No. 232,902
Claims priority, application Germany, Mar. 10, 1971, P 21 11 412.5
Int. Cl. C08g *20/18*
U.S. Cl. 260—18 N 8 Claims

A pourable, storable, polymerizable lactam-catalyst-activator mixture comprising at least one lactam having more than 5 ring members, at least one alkaline catalyst and at least one activator being embedded in an organic material.

3,790,516
POURABLE, STORABLE, POLYMERIZABLE LACTAM-CATALYST-ACTIVATOR COMPOSITION
Heinz Jorg Rosenbaum, Hans Rudolph, Rolf Dhein, and Klaus Reinking, Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Mar. 8, 1972, Ser. No. 232,903
Claims priority, application Germany, Aug. 21, 1971, P 21 41 985.2
Int. Cl. C08g *20/18*
U.S. Cl. 260—18 N 9 Claims

A pourable, polymerizable lactam-catalyst-activator mixture which is stable on storage comprising at least one lactam having more than 5 ring members, at least one activator and a member of the group consisting of an alkaline catalyst and an 8 to 90% by weight solution of an alkaline catalyst in a lactam having more than 5 ring members said catalyst or solution of the catalyst and optionally said activator being embedded in an organic material.

3,790,517
CRYSTALLINE POLYPROPYLENE COMPOSITIONS
Masaharu Koizumi, Otake, and Motoyasu Yusawa, Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
No Drawing. Filed Aug. 7, 1972, Ser. No. 278,191
Int. Cl. C08f *19/14, 21/04*
U.S. Cl. 260—23 H 5 Claims

A crystalline polypropylene composition consisting essentially of crystalline polypropylene and a molecular weight adjusting agent selected from the group consisting of halogen- or acid amide-substituted diphenyldisulfides, halogen- or acid amide-substituted bivalent metallic dithiophenates, and derivatives of such disulfides and dithiophenates, the molecular weight adjusting agent being incorporated in an amount of 0.0001–1% by weight based on the weight of the polypropylene, the composition having been heated at above 200° C.

3,790,518
CEMENT COMPOSITIONS
Herbert Jackson Shearing, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Mar. 11, 1971, Ser. No. 123,418
Claims priority, application Great Britain, Mar. 18, 1970, 13,039/70
Int. Cl. C08g *51/24*
U.S. Cl. 260—25 8 Claims

Cement compositions comprising a hydraulic cement, a silica filler, water, an organic polyisocyanate and the reaction product of castor oil with a hard resin derived from rosin. These compositions set rapidly and provide strong, durable flooring surfaces having good flexibility.

3,790,519

ASPHALTIC-PLASTOMERIC COMPOSITION

Harold J. Wahlborg, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

No Drawing. Filed Mar. 10, 1972, Ser. No. 233,744

Int. Cl. C08f *45/52, 15/04, 15/42*

U.S. Cl. 260—28.5 AS **14 Claims**

A blend of asphaltic material and plastomeric material, with or without polyethylene, in which the plastomeric material is in the form of an EPM or EPDM plastomer in which ethylene represents 75–90 mol percent of the ethylene-propylene content.

3,790,520

ACRYLATE POLYMER LATEX COMPOSITIONS WITH ALIPHATIC GLYCOLS AND/OR ALIPHATIC GLYCOL ETHERS

Robert Ludwig, Lorain, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 24,795, Apr. 1, 1970. This application May 3, 1972, Ser. No. 250,081

Int. Cl. C08f *45/24, 45/26*

U.S. Cl. 260—29.6 E **9 Claims**

Latices containing alkyl acrylate and alkyl methacrylate copolymers of more than 40% of said alkyl acrylate and/or alkyl methacrylate ester, having a homopolymer glass temperature in the range of less than 10° C., and about 15 to 55% of a vinylidene monomer copolymerizable therewith having a terminal $CH_2<$ group, the homopolymer of said vinylidene comonomer having a glass temperature greater than about 20° C., and greater than 10 parts per 100 parts of copolymer of an aliphatic glycol and/or glycol ether, provide clear, weather-resistant films deposited from the latex and are useful in improving the physical properties of paper and in adhering fabrics.

3,790,521

METHOD FOR MAKING NONCOLLOIDAL PARTICLES LIKE FIBERS AND POWDERS FROM LARGER GRANULES OF ETHYLENE/CARBOXYLIC ACID COPOLYMERS

Gordon D. McCann and Earl T. Dumitru, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,635

Int. Cl. C08f *47/16*

U.S. Cl. 260—29.6 N **8 Claims**

Ethylene/carboxylic acid copolymers of low acid content in the form of pieces such as molding granules are converted into noncolloidal particles in the nature of fine fibers, microscopic spheroids and powders by digesting in aqueous triethylamine; by digesting in aqueous alkaline media containing n-hexanol, microscopic spheroids and powders are obtained. Useful for preparation of plastic articles, coatings, and impregnations.

3,790,522

POLYEPOXIDE AND AMINE HARDENER COMPOSITIONS

Joseph Francis Bliss, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 822,306, May 6, 1969. This application Nov. 9, 1971, Ser. No. 197,102

Int. Cl. C08g *51/04, 51/26*

U.S. Cl. 260—30.4 EP **11 Claims**

Compositions comprising a polyepoxide or an amine hardener and less than 0.1 percent by weight of a quaternary ammonium compound based on the weight of the polyepoxide or amine hardener employed which compositions resist filler hard-settle upon storage and are suitable precursor compositions for cured epoxide products.

3,790,523

PROCESS FOR PREPARING ACRYLIC ORGANOSOL COATING COMPOSITIONS

Gary W. Orvis, Flint, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Mar. 20, 1972, Ser. No. 236,443

Int. Cl. C08f *45/26, 47/10;* **C08j** *1/46*

U.S. Cl. 260—30.6 R **6 Claims**

The improved process for preparing an acrylic organosol coating composition comprises the following steps:

(1) blending together pigment, an organic dispersant, an acrylic organosol and a monomeric plasticizer;
(2) heating the pigment blend prepared above and applying a vacuum to remove solvent and form a powder;
(3) high shear mixing the powder by charging the powder into a roll mill to form pigment chips;
(4) forming a mill base by dissolving the pigment chips in an organic solvent; and
(5) blending the mill base with an acrylic organosol to form an acrylic organosol coating composition;

the resulting acrylic organosols are particularly useful as finishes for the exterior of automobiles and trucks.

3,790,524

PROCESS FOR PREPARING VULCANIZED EPIHALOHYDRIN POLYMERS

Yoshiomi Saito, Kamakura, Hiroshi Sasaki, Kawasaki, Mamoru Yamaguchi, Yokohama, Hideo Fukuda, Chigasaki, Humio Yamada, Yokohama, and Koji Kimura, Tokyo, Japan, assignors to The Japanese Geon Company, Ltd., Tokyo, Japan

No Drawing. Filed Apr. 20, 1971, Ser. No. 135,779

Claims priority, application Japan, Apr. 25, 1970, 45/35,119

Int. Cl. C08g *23/06, 51/60*

U.S. Cl. 260—45.8 N **8 Claims**

A process for preparing vulcanized epihalohydrin polymers which comprises heating at least a polymer selected from the group consisting of a homopolymer of epihalohydrin and a copolymer of epihalohydrin with at least one other copolymerizable monomer in the presence of (A) 0.1–10 parts by weight of at least one compound selected from the group consisting of polyalkylenepolyamines, polyalkylenepolyamine carbamates and thioureas which are optionally substituted with alkyl groups of 1–4 carbon atoms leaving at least one hydrogen atom unsubstituted, (B) 1–20 parts by weight of magnesium oxide and (C) 0.2–5 parts by weight of 2-mercaptobenzimidazole.

3,790,525

4-PIPERIDONE KETAL DERIVATIVES, THEIR PREPARATION AND THEIR USE AS STABILIZERS

Keisuke Murayama, Toshimasa Toda, Eiko Mori, Katsuaki Matsui, Tomoyuki Kurumada, Noriyuki Ohta, and Ichiro Watanabe, Tokyo, Japan, assignors to Sankyo Company Limited

No Drawing. Filed Jan. 19, 1972, Ser. No. 219,133

Int. Cl. C08f *45/60;* **C08g** *51/60*

U.S. Cl. 260—45.8 NZ **7 Claims**

A synthetic polymer composition stabilized against photo- and thermal-deterioration is disclosed. The stabilization is effected by incorporating in the composition an effective amount of certain 4-piperidone ketal derivatives.

3,790,526

POLYOLEFIN STABILIZED WITH 3,5-DISUBSTITUTED - 4 - HYDROXYBENZYL ALCOHOL OR AMINE

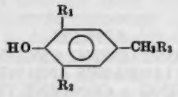
Gordon D. Brindell, Crystal Lake, and Rudy F. Macander, Cary, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

No Drawing. Filed May 26, 1972, Ser. No. 257,177

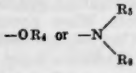
Int. Cl. C08f 45/58, 45/60

U.S. Cl. 260—45.85 S 21 Claims

Polyolefin normally tending to undergo oxidative deterioration stabilized with a compound of the following formula is disclosed:



wherein R_1 and R_2 are independently aralkyl or alkyl with the proviso that at least one aralkyl group contains no branching on the carbon alpha to the phenylene group or at least one alkyl group contains no branching on the carbon alpha to the phenylene group but has at least one branch on the carbon beta to the phenylene group R_3 is hydroxy,



R_4, R_5, and R_6 are alkyl, cycloalkyl, aralkyl, aryl, or alkaryl and R_6 may additionally be hydrogen.

3,790,527

FLEXIBLE TACK FREE SILICONE RESINS

Duane F. Merrill, Ballston Spa, N.Y., assignor to General Electric Company

No Drawing. Filed July 21, 1972, Ser. No. 274,111

Int. Cl. C08f 11/04

U.S. Cl. 260—46.5 R 8 Claims

There is provided a flexible, tack-free silicone resin by hydrolyzing first a diorganodihalosilane in a hydrolysis mixture comprising water, acetone and a water-immiscible solvent and then in a second and independent step hydrolyzing and adding to the same mixture an organotrihalosilane. The silicone resin obtained by this hydrolysis procedure is the desired resin of the present case which is not brittle and dries to a non-tacky state irrespective of whether it is dried at room temperature or dried at elevated temperatures.

3,790,528

PROCESS FOR PREPARATION OF OXYBENZOYL POLYMER

Kiyoshi Tesaki and Michio Hiraoka, Tokyo, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

No Drawing. Filed Dec. 27, 1971, Ser. No. 212,730

Int. Cl. C08g 17/02

U.S. Cl. 260—47 C 9 Claims

A process for preparation of oxybenzoyl polymers comprising reacting m- or p-hydroxybenzoic acids having or not having substituent on aromatic nucleus or alkaline salts thereof with acid-halogenation agent in a mole rate of 1 mole of the said hydroxybenzoic acids or alkaline salts thereof for more than 0.5 mole of acid-halogenation agent.

3,790,529

PROCESS FOR PRODUCING CATIONIC WATER SOLUBLE POLYMER BY REACTING FORMALDEHYDE, AMINE, A POLYMER OF ACRYLAMIDE OR METHACRYLAMIDE AND PRECIPITATING SAID POLYMER WITH A WATER SOLUBLE SALT OF A POLYBASIC ACID

Kinji Fujimura, Tokyo, and Katsutoshi Tanaka, Chigasaki, Japan, assignors to Kabushiki Kaisha Kyoritsu Yuki Kogyo Kenkyusho, Tokyo, Japan

No Drawing Filed Oct. 5, 1971, Ser. No. 186,794

Int. Cl. C08g 9/04

U.S. Cl. 260—72 R 8 Claims

Formaldehyde and amine are caused to react with an aqueous solution of a water soluble polymer which is a homopolymer of acrylamide or methacrylamide, a copolymer of them, and a copolymer of acrylamide or methacrylamide with a copolymerizable monomer with them and the polymer has more than 50 mol percent of acid amide group, and more than 5 mol percent of the acid amide group is subjected to aminomethylation, thereby to obtain a cation modified polymer aqueous solution.

A water soluble salt such as a normal salt prepared from a metal such as K, Na, Li, or Mg and a dibasic acid is added to the cation modified polymer aqueous solution to separate a polymer. The resulting polymer is subjected to dehydration and drying at a temperature of below 80° C. thereby to prepare a cationic water soluble polymer.

3,790,530

METHOD OF MAKING AMIDE-IMIDE RESINS, AROMATIC AMIDES AND AROMATIC POLYAMIDE RESINS

Ernest C. Koerner, William W. Wareham, and Donny R. Disque, Fort Wayne, Ind., assignors to Phelps Dodge Magnet Wire Corporation, Fort Wayne, Ind.

No Drawing. Continuation-in-part of abandoned application Ser. No. 819,954, Apr. 28, 1969. This application Nov. 3, 1971, Ser. No. 195,502

Int. Cl. C08g 22/00

U.S. Cl. 260—77.5 R 10 Claims

A method of making essentially totally imidized polyamide-imide resins, aromatic amides, and other aromatic polyamide resins which can be applied to articles without the resins undergoing substantial chemical change as the resins are being applied, and intermediates formed during the performance of the method. Specific polyamide-imide resins which can be made in accordance with the method of the invention are those derived from tricarboxylic acids or anhydrides thereof, such as trimellitic acid or trimellitic acid anhydride, and a diisocyanate, such as p,p'-diphenyl methane diisocyanate. The method comprises an initial reaction under mild conditions and a subsequent reaction under more severe conditions.

3,790,531

HIGH MOLECULAR WEIGHT LINEAR COPOLYAMIDES CONTAINING OXAMIDE GROUPS

Geert Christoph, Eduard Radlmann, and Gunther Nischk, Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Nov. 26, 1971, Ser. No. 202,671

Claims priority, application Germany, Nov. 27, 1970, P 20 58 414.9

Int. Cl. C08g 20/20, 20/06

U.S. Cl. 260—78 R 3 Claims

New copolyamides which are obtained by cocondensation of dicarboxylic acids containing oxamide groups, cer-

tain diamines, and aliphatic dicarboxylic acids and hexamethylene diamine, or a lactam. The copolyamides are useful for the production of filaments and films.

3,790,532

NOVEL CURED EPOXY RESIN COMPOSITION

Hideo Fukutani and Makoto Tokizawa, Tokyo, and Hiroyoshi Okada, Kawasaki, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

No Drawing. Filed Aug. 2, 1971, Ser. No. 168,488

Claims priority, application Japan, Aug. 28, 1970, 45/75,446

Int. Cl. C08f *3/62*; C08g *30/12*

U.S. Cl. 260—78.4 EP **4 Claims**

A cured epoxy resin composition is prepared by curing an ester of dicarboxylic acid containing epoxy radicals. The cured epoxy resin composition has high tracking resistance, good arc resistance, and high impact strength, and is particularly useful for casting of electrical parts.

3,790,533

PRESSURE SENSITIVE ADHESIVE COPOLYMERS AND TAPES THEREFROM

Carlos M. Samour, 324 Linden St., Wellesley, Mass. 02134

No Drawing. Filed Jan. 26, 1972, Ser. No. 221,106

Int. Cl. C08f *15/40*

U.S. Cl. 260—78.5 R **20 Claims**

Pressure sensitive adhesive polymers of monomers consisting of certain carboxylic acid vinyl monomers, an aminoalkyl acrylate or methacrylate in an amount which is within ±10% of the acid-base equivalent of the carboxylic acid vinyl monomers, and an alkyl acrylate in an amount from 65 to 99.6% by weight of the total monomers. Other copolymerizable monomers may optionally be present, including cross-linking monomers. Tapes coated with the pressure sensitive adhesive polymers are described.

3,790,534

INHIBITING PREVULCANIZATION OF RUBBER FORMULATIONS

Marion J. Gattuso, Hoffman Estates, and Robert J. Arnold, Chicago, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Mar. 16, 1972, Ser. No. 235,415

Int. Cl. C08c *11/54*; C08d *9/00*

U.S. Cl. 260—79.5 B **10 Claims**

Inhibiting premature vulcanization of vulcanizable diene rubber formulations by incorporating therein a substituted-carbamyl disulfide.

3,790,535

METHOD OF REGENERATING CHELATE RESINS HAVING MERCURY ADSORBED THERETO

Kensuke Motani, Tokuyama, Tadahiro Kiyotoshi, Tokyo, and Akihiko Nakahara, Tokuyama, Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi-ken, Japan

Filed Oct. 6, 1972, Ser. No. 295,486

Int. Cl. C08g *23/00*

U.S. Cl. 260—79 **3 Claims**

A method of regenerating a chelate resin having mercury adsorbed thereto, which comprises contacting the resin with a solution of a sulfide of an alkali metal, barium or ammonium having a pH of at least 11.0, preferably at least 13.0, to thereby liberate the mercury from the chelate resin.

3,790,536

ARYLENE SULFIDE POLYMER PROCESS

Fernando C. Vidaurri, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 18, 1972, Ser. No. 289,863

Int. Cl. C08g *25/00*

U.S. Cl. 260—79.1 **6 Claims**

A process for increasing the production capacity of an arylene sulfide polymer process is described wherein incremental quantities of an arylene halide reactant are added to an alkali metal sulfide reactant in the presence of a polar organic compound under suitable process conditions to provide maximum production rates for arylene sulfide polymers at moderate reaction temperatures and pressures.

3,790,537

POLYMERS CONTAINING CYCLO-1,1-DIALLYLGUANIDINE LINKAGES AND WET STRENGTH PAPER HAVING A CONTENT THEREOF

Hans Peter Panzer, Stamford, Conn., and Louis Vincent McAdams, East Greenwich, R.I., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 18, 1971, Ser. No. 107,456

Int. Cl. C08f *3/86, 15/02*

U.S. Cl. 260—80.3 N **2 Claims**

Water-soluble polymers are prepared by homopolymerizing 1,1-diallylguanidine or by copolymerizing 1,1-diallylguanidine. The resulting polymers are cationic and are flocculating agents. When glyoxylated (by reaction with glyoxal) they are water-soluble cationic thermosetting wet strength agents for paper. Wet strength paper containing this polymer rapidly loses its wet strength on normal weathering.

3,790,538

PROCESS FOR THE PRODUCTION OF THERMOREVERSIBLE COACERVATES

Nikolaus Schön, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 17, 1971, Ser. No. 116,252

Claims priority, application Germany, Mar. 4, 1970, P 20 10 117.1

Int. Cl. C08f *15/02*

U.S. Cl. 260—29.6 H **6 Claims**

A process for the production of a thermoreversible coacervate, wherein from 30 to 70 mol percent of acrylic acid and from 70 to 30 mol percent of acrylamide is copolymerized in aqueous solution at a temperature of from 15° to 80° C. using redox catalyst comprising a water soluble persulphate and a reducing agent, and the polymer solution obtained is optionally cooled to a temperature below 15° to 30° C.

3,790,539

METHOD OF PRODUCING OF ALTERNATING COPOLYMERS OF CONJUGATED DIENES AND CONJUGATED POLAR VINYL MONOMERS

Akira Onishi and Koichi Irako, Kodaira, Yoshihiro Hayakawa, Higashi-Murayama, Takeshi Shimomura, Kobe, Takahiro Kawagoe, Tokorozawa, and Shoji Miyamoto, Higashi-Murayama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of abandoned application Ser. No. 865,114, Oct. 9, 1969. This application Apr. 13, 1972, Ser. No. 243,898

Claims priority, application Japan, Oct. 14, 1968, 43/74,208; Oct. 16, 1968, 43/74,986; Oct. 18, 1968, 43/75,551; Oct. 22, 1968, 43/76,479; Feb. 8, 1969, 44/9,008; Feb. 13, 1969, 44/10,030; Mar. 7, 1969, 44/16,793

Int. Cl. C08d *1/14*

U.S. Cl. 260—80.7 **34 Claims**

Alternating copolymers of a conjugated diene with a conjugated polar vinyl monomer, wherein the conjugated

diene unit and the conjugated polar vinyl monomer unit are bonded substantially alternately, are produced by copolymerizing said conjugated diene with said conjugated polar vinyl monomer by means of a catalyst prepared in the presence of a conjugated polar vinyl monomer to be used in the copolymerization reaction from a component (A) of a compound of a transition metal of the Group IV or V in the Periodic Table and a component (B) selected from the group consisting of an aluminum-containing compound; a combination of an aluminum compound and a tin compound; a combination of an organometallic compound and a metal halide; and an organoaluminum compound. This copolymerization activity can be improved by adding a component (C) of a radical initiator selected from the group consisting of organic peroxides, organonitrile compounds and trialkylboron~oxygen systems to the above described components (A) and (B). Furthermore, the molecular weight of the alternating copolymers can be controlled by adding a molecular weight regulator selected from the group consisting of mercaptans, disulfides and carbon polyhalides containing bromine or iodine as an essential component to the polymerization reaction system.

3,790,540

ELASTOMERIC FLUORINATED TERPOLYMER HAVING GOOD THERMAL STABILITY

Julius Eugene Dohany, Berwyn, and Alfred Case Whiton, Blue Bell, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed Aug. 23, 1971, Ser. No. 174,216
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.77 **5 Claims**

This invention relates to a novel and thermally stable terpolymer of vinylidene fluoride, hexafluoropropane and trifluoroethylene in respective quantities of about 29–55% by weight hexafluoropropene, 2–20% by weight trifluoroethylene and the remainder vinylidene fluoride which terpolymer forms amine-cured vulcanizates with excellent initial and heat-aged properties.

3,790,541

ETHYLENE-VINYL AROMATIC TELOMER WAXES AND PROCESSES OF PREPARING THEM

Arthur W. Langer, Jr., Plainfield, N.J., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 85,781, Oct. 30, 1970. This application Oct. 12, 1971, Ser. No. 188,476
The portion of the term of the patent subsequent to Oct. 2, 1990, has been disclaimed
Int. Cl. C08f *1/76, 19/04*
U.S. Cl. 260—88.2 C **9 Claims**

Novel wax compositions containing alkyl cycloalkyl structures in addition to alkyl aromatic telomer structures and also including copolymer telomer structures. These wax compositions have a molecular weight ranging from 500 to 5000.

3,790,542

METHOD FOR POLYMERIZING VINYL CHLORIDE

Shunichi Koyanagi, Naoetsu-shi, Hajime Kitamura, Niigata-ken, Kinya Ogawa, Naoetsu-shi, and Toshihide Shimizu, Niigata-ken, Japan, assignors to Shinetsu Chemical Company

Filed Sept. 15, 1970, Ser. No. 72,446
Int. Cl. C08f *1/60*
U.S. Cl. 260—92.8 R **1 Claim**

The polymerization is conducted in a medium which does not dissolve the produced polymer or copolymer. It is also conducted in the presence of a polymerization catalyst comprising acetyl cyclohexyl sulfonyl peroxide and a member selected from the group consisting of tertiary butyl peroxypivalate, diisopropyl peroxydicarbonate, di-2-ethylhexyl peroxydicarbonate, α,α-azobis-2,4-dimethylvaleronitrile and mixtures thereof.

3,790,543

POLYMERIZATION OF ALICYCLIC COMPOUNDS

Gunther Lehnert and Dieter Maertens, Leverkusen, and Josef Witte, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 9, 1972, Ser. No. 224,925
Claims priority, application Germany, Feb. 10, 1971, P 21 06 302.5
Int. Cl. C08f *1/34*
U.S. Cl. 260—93.1 **17 Claims**

A process for the polymerization of unsaturated alicyclic compounds, characterized in that at least one cyclic olefine having 4, 5, 7 or more ring carbon atoms and at least one olefinic double bond in the ring is polymerized in the presence of a catalyst system consisting of

(a) a halide or oxyhalide of molybdenum or tungsten,
(b) an organometallic tin compound and
(c) optionally a Lewis base as co-catalyst.

3,790,544

PROCESS FOR THE POLYMERIZATION OF CYCLOALKENES

Dieter Maertens, Günther Lehnert, and Gottfried Pampus, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 9, 1972, Ser. No. 224,926
Claims priority, application Germany, Feb. 10, 1971, P 21 06 301.4
Int. Cl. C08f *1/34*
U.S. Cl. 260—93.1 **14 Claims**

A process for the polymerization of unsaturated alicyclic compounds, characterized in that at least one cyclic olefine having 4, 5, 7 or more ring carbon atoms and at least one olefinic double bond in the ring is polymerized in the presence of a catalyst system consisting of

(a) a salt of molybdenum or tungsten,
(b) an organometallic compound of aluminum and
(c) a Lewis acid or an adduct of a Lewis acid and a Lewis base as co-catalyst and the catalyst for this polymerization.

3,790,545

PREPARATION OF HIGH CIS-CONTENT POLYPENTENAMER POLYMERS

Robert J. Minchak, Parma Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed May 18, 1972, Ser. No. 254,631
Int. Cl. C08f *1/34*
U.S. Cl. 260—93.1 **8 Claims**

Polypentenamer polymers having high cis-content are prepared in a process comprising polymerizing cyclopentene monomer with a catalyst comprising an organoaluminum compound and a tungsten salt at a temperature of from about —40° C. to about —60° C. and below. The tungsten salt is added after the organoalumium compound and at polymerization temperatures. The polymers are sulfur-vulcanizable and have good low temperature properties.

3,790,546

PROCESS FOR THE PREPARATION OF TRANS-POLYPENTENAMER

Nikolaus Schön and Gottfried Pampus, Leverkusen, and Josef Witte, Cologne-Stammheim, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Original application June 25, 1969, Ser. No. 836,633, now abandoned. Divided and this application June 1, 1972, Ser. No. 258,749
Claims priority, application Germany, July 10, 1968, P 17 70 844.0
Int. Cl. C08f *1/34*
U.S. Cl. 260—93.1 **4 Claims**

Catalyst for polymerizing cyclopentene comprising:

(a) A reaction product of a tungsten or tantalum halide and an epoxide;

(b) An organoaluminum compound and a process for polymerizing cyclopentene.

3,790,547

PROCESS FOR THE ANIONIC POLYMERIZATION OF STYRENE

Daniel Muller, Pau, France, assignor to Nationale des Petroles d'Aquitaine, Paris, France

Filed Aug. 11, 1971, Ser. No. 170,717
Claims priority, application France, Aug. 14, 1970, 7030091; July 20, 1971, 7126503
Int. Cl. C08f *1/04, 7/04, 19/00*
U.S. Cl. 260—93.5 R 1 Claim

A fast polymerization process for monomers which can be polymerized by anionic catalysis, particularly styrene, possibly mixed with butadiene or in the presence of a polymer.

The process is characterized by the fact that the monomer or monomers are bulk-polymerized in a thin-film polymerizing plant, using an anionic polymerization catalyst, in particular an alkaline metal such as sodium, or an organo-metallic alkaline metal compound such as butyllithium.

The process results in transparent polymers free of residual monomer, showing low polydispersion and with a high molecular weight. In addition, they are not yet de-activated when leaving the polymerization plant, and can be used to obtain graft and sequence copolymers.

3,790,548

CHLORINATING POLYETHYLENE

Hans-Georg Trieschmann, Hambach, Helmut Pfannmueler, Limburgerhof, and Gerhard Zeitler, Hessheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Continuation of abandoned application Ser. No. 820,618, Apr. 30, 1969. This application Feb. 8, 1971, Ser. No. 113,610
Claims priority, application Germany, May 1, 1968, P 17 70 312.7, P 17 70 313.8
Int. Cl. C08f *3/04, 27/02*
U.S. Cl. 260—94.9 H 6 Claims

A process for chlorination polyethylene in which particulate high-pressure polyethylene is suspended in a chlorohydrocarbon and treated with chlorine.

3,790,549

TERMINALLY REACTIVE POLYMERS

George Feniak, Wyoming, Ontario, Canada, assignor to Polymer Corporation Limited, Sarnia, Ontario, Canada

No Drawing. Filed Sept. 10, 1971, Ser. No. 179,536
Claims priority, application Canada, Sept. 25, 1970, 94,062
Int. Cl. C08d *11/00;* C08f *3/14, 3/16*
U.S. Cl. 260—94.8 4 Claims

Terminally reactive polymers are produced by ozonizing high molecular weight polymers of branched conjugated diolefins such as isoprene and reacting the ozonized products with modifying compounds such as hydrazine, hydroxylamine and dihydrazino compounds.

The reactive polymers are low molecular weight materials having terminal hydrazone, oxime and hydrazide groups; they react with polyfunctional compounds such as diisocyanates or epoxy resins to form cross-linked structures.

3,790,550

FLUID BED POLYMERIZATION PROCESS

Adam R. Miller, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Original application Nov. 21, 1969, Ser. No. 878,774. Divided and this application Oct. 26, 1971, Ser. No. 192,195
Int. Cl. C08f *3/06, 15/40, 1/00*
U.S. Cl. 260—94.9 P 10 Claims

Polymerization catalysts in the form of dry powders are continuously fed to a fluidized bed reactor under essentially plug-flow conditions by a sequential repetition of the steps of dispensing under controlled conditions, a desired quantity of catalyst from a catalyst supply source to a chamber which is alternately communicable with such supply source and the reaction zone of the fluidized bed reactor, isolating the dispensed catalyst from the catalyst supply source, exposing the dispensed catalyst to the reaction zone of the fluidized bed reactor and rapidly injecting the catalyst into the reaction zone with a carrier gas.

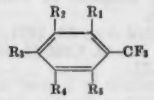
3,790,551

PROCESS FOR PRODUCING BUTADIENE POLYMER

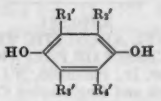
Yoshiharu Yagi, Toyonaka, Akira Kobayashi, Nishinomiya, and Hiroshi Sato, Takatsuki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka-fu, Japan

No Drawing. Filed June 4, 1971, Ser. No. 150,191
Claims priority, application Japan, June 4, 1970, 45/48,958
Int. Cl. C08d *1/14, 3/06*
U.S. Cl. 260—94.3 10 Claims

A process for producing butadiene polymer which comprises polymerizing 1,3-butadiene in the presence of a catalyst system consisting essentially of (A) at least one of nickel and cobalt compounds, (B) a trialkyl aluminum compound, (C) a benzotrifluoride compound represented by the formula:



(wherein R_1, R_2, R_3, R_4 and R_5 are each a hydrogen atom, a halogen atom, an alkyl group or a fluoroalkyl group), and (D) a hydroquinone compound represented by the formula:



(wherein R_1', R_2', R_3' and R_4' are each a hydrogen atom or a halogen atom or the combination of R_1' with R_2' and/or of R_3' with R_4' is an aromatic condensed ring(s) and the remaining substituents are, if any, each a hydrogen atom or a halogen atom) and in the coexistence of water to give a butadiene polymer containing predominantly cis-1,4 structure and having a regulated molecular weight.

3,790,552

METHOD OF REMOVING HEPATITIS-ASSOCIATED ANTIGEN FROM A PROTEIN FRACTION USING POLYETHYLENE GLYCOL

Alan J. Johnson, New York, and Jack Newman, Pelham, N.Y., assignors to the United States of America as represented by the Secretary, Department of Health, Education, and Welfare

No Drawing. Filed Mar. 16, 1972, Ser. No. 235,211
Int. Cl. A23j *1/06;* C07g *7/00*
U.S. Cl. 260—112 B 28 Claims

A method of removing hepatitis-associated antigen from a protein fraction by regulating protein concentration, ionic strength of the solution, and pH, and fractionating the mixture by the use of polyethylene glycol in a particular concentration range is disclosed. The pH of the solution should be removed from the isoelectric point of the material being precipitated.

3,790,553

EXTRACTION PROCESS FOR PREPARATION OF VITAL WHEAT GLUTEN FROM WHOLE WHEAT KERNELS

Ganta V. Rao and Oliver B. Gerrish, Sr., Hutchinson, Kans., assignors to Far-Mar-Co., Inc.

No Drawing. Filed Sept. 25, 1972, Ser. No. 291,635

Int. Cl. A23j 1/12
U.S. Cl. 260—112 G 14 Claims

Gluten protein may be recovered from the whole wheat kernel according to a two-stage extraction process. The kernel is tempered to a moisture content, by weight, from about 15% to saturation, the tempered kernel is crushed, flaked or ground and the low molecular weight proteins are extracted from the crushed wheat in a water slurry having a wheat to water ratio, by weight, of 1:1 to 1:5 and a pH of 4.5–8.0. The high molecular weight proteins are extracted from the crushed wheat in a pH 0.9–12 slurry consisting of one part, by weight, water-extraction solid residue and from 1–5 parts, by weight, mild base, such as ammonium hydroxide.

3,790,554

HEPTAPEPTIDE INTERMEDIATE TO GONADOTROPIN-RELEASING HORMONE

George Rogelio Flouret, Waukegan, Ill., assignor to Abbott Laboratories, Chicago, Ill.

No Drawing. Filed Sept. 24, 1971, Ser. No. 183,691

Int. Cl. C07c 103/52; C07g 7/00; C08h 1/00
U.S. Cl. 260—112.5 8 Claims

The synthesis of the heptapeptide Ser-Tyr-Gly-Leu-Arg-Pro-Gly-amide carrying easily removable protective groups on the Ser, Tyr and Arg moieties is described; the correspondingly protected hexapeptide is used as the starting material. The heptapeptide, upon removal of any protective group on the amino-N of the serine moiety, is an important intermediate for the preparation of the gonadotropin-releasing hormone.

3,790,555

OCTAPEPTIDE DERIVATIVE OF GONADOTROPIN-RELEASING HORMONE

George Rogelio Flouret, Waukegan, and John Wayne Cole, Deerfield, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed Jan. 20, 1972, Ser. No. 219,567

Int. Cl. C07c 103/52; C07g 7/00; C08h 1/00
U.S. Cl. 260—112.5 8 Claims

The synthesis of the octapeptide Trp-Ser-Tyr-Gly-Leu-Arg-Pro-Gly-amide carrying easily removable protective groups on the Ser, Tyr, Arg and Trp moieties is described. The new synthesis uses as the starting material two tetrapeptide fragments carrying easily removable protective groups. One of these fragments, Trp-Ser-Tyr-Gly-OH with suitable protective groups, also is a part of the present invention. After coupling of the two fragments, the protective group on the amino-N of the tryptophane moiety is removed to obtain an octapeptide carrying easily removable protective groups which can be retained while building up the molecule to the decapeptide chain which is the gonadotropin-releasing hormone, after removal of these protective groups.

3,790,556

ORGANIC SOLVENT SOLUBLE DIAZONIUM COMPOUND FORMED FROM ANIONIC SULFATE OR SULFONATE SURFACTANTS

Towers Doggett, Westbrook, Maine, assignor to Scott Paper Company, Delaware County, Pa.

No Drawing. Filed Apr. 28, 1971, Ser. No. 138,336

Int. Cl. C07c 113/00; G03c 1/56; G03f 7/02
U.S. Cl. 260—141 10 Claims

Light-sensitive, water-insoluble compounds which are formed by reacting an anionic surfactant of the formula

with the formaldehyde condensation product of a diphenylamine-4-diazonium salt and which are soluble in a wide range of organic solvents, and negative working lithographic plates provided with a coating of the light-sensitive compounds.

3,790,557

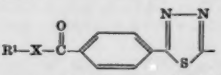
THIADIAZOLYL-AZO-PHENYL OR -TETRAHYDROQUINOLINE COMPOUNDS

Max A. Weaver and James M. Straley, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Jan. 19, 1972, Ser. No. 219,152

Int. Cl. C09b 29/36
U.S. Cl. 260—158 10 Claims

Monoazo compounds consisting of a diazo component having the formula



in which X is oxygen, imino or alkylimino and R^1 is hydrogen, alkyl, cycloalkyl or aryl, and an aniline or 1,2,3,4-tetrahydroquinoline disperse azo dye coupling component produce bright red to bluish-red shades on polyester fibers and exhibit good fastness to light and resistance to sublimation.

3,790,558

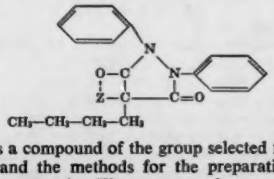
PYRAZOLIDONE DERIVATIVES SUBSTITUTED ON THE 4 POSITION WITH PECTIN OR ALGIN

Georges Negrevergne, Bordeaux, France, assignor to The Purdue Frederick Company, Norwalk, Conn.

No Drawing. Application May 14, 1969, Ser. No. 856,508, now Patent No. 3,629,282, which is a division of application Ser. No. 691,197, Dec. 18, 1967, now Patent No. 3,487,046, which is a continuation-in-part of application Ser. No. 362,393, Apr. 24, 1964, which in turn is a continuation-in-part of application Ser. No. 121,796, Apr. 24, 1961, both now abandoned. Divided and this application Nov. 18, 1971, Ser. No. 200,259

Int. Cl. C07d 49/04, 49/08
U.S. Cl. 260—209.5 2 Claims

Hydrogen bonded compounds of the structure:



wherein Z is a compound of the group selected from algin and pectin and the methods for the preparation of the aforesaid compounds. The compounds are useful in achieving an anti-inflammatory effect.

3,790,559
PRODUCTION OF ERYTHROMYCYLAMINE COMPOUNDS
Eric Wildsmith, Chamberley, England, assignor to Lilly Industries, Ltd., Henrietta Place, London, England
No Drawing. Filed Mar. 17, 1971, Ser. No. 125,399
Claims priority, application United Kingdom, Apr. 13, 1970, 17,527/70
Int. Cl. C07c *129/18*
U.S. Cl. 260—210 E **6 Claims**

Erythromycylamine compounds are produced by subjecting an erythromycin hydrazone azine or imine to reduction by means of a highly electropositive metal or additionally, in the case of the imine, to reduction by means of a complex metal hydride. A process is also provided for preparing the novel imines, which are useful as antibiotic agents, particularly against gram-positive organisms.

3,790,560
DERIVATIVES OF LINCOMYCIN AND ITS ANALOGS AND PROCESS
Brian Bannister, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Continuation-in-part of application Ser. No. 198,990, Nov. 15, 1971, which is a continuation-in-part of abandoned applications Ser. No. 158,075, June 29, 1971, and Ser. No. 161,909, July 12, 1971, the latter being a continuation-in-part of abandoned application Ser. No. 156,100, June 23, 1971. This application Mar. 22, 1972, Ser. No. 237,129
Int. Cl. C08b *19/00*
U.S. Cl. 260—210 R **23 Claims**

Alkyl 7-deoxy-7-mercaptoalkylthio-α-thiolincosaminides useful as intermediates for preparing antibacterially active 7-deoxy-7-mercaptoalkylthio-lincomycins are prepared by heating alkyl N-acyl-6,7-aziridino-6-deamino-7-deoxy-α-thiolincosaminides with an appropriate sulfide in the presence of glacial acetic acid or other anhydrous lower alkanoic acid, or anhydrous benzoic acid or other arenoic acid or not more than 12 carbon atoms.

3,790,561
PREPARATION OF A CALCIUM AND MAGNESIUM ION SEQUESTRANT
Donald M. MacDonald, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.
No Drawing. Original application June 28, 1971, Ser. No. 157,616, now Patent No. 3,740,339. Divided and this application Mar. 22, 1973, Ser. No. 343,917
Int. Cl. C02b *5/06;* **C08b** *15/04;* **C11d** *3/22*
U.S. Cl. 260—212 **5 Claims**

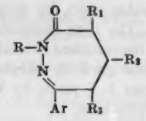
The elimination of phosphorus-containing compounds from detergent formulations, which cause water pollution, and their replacement with non-phosphorus-containing compounds of equal efficacy is achieved by employing the cured product of the reaction between 6-carboxy cellulose and an aqueous solution of a Lewis acid catalyst.

3,790,562
METHYL CELLULOSE-BORON ALKOXIDE COMPOUNDS
Jett C. Arthur, Jr., Metairie, and Malkiat S. Bains, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed May 23, 1972, Ser. No. 256,021
Int. Cl. C08b *11/02*
U.S. Cl. 260—231 R **16 Claims**

This invention relates to a method for preparing carbohydrate-boron alkoxide compounds. Under anhydrous conditions, stable compounds of methyl cellulose and boron alkoxides, such as boron ethoxide, boron propoxide, and boron isopropoxide, were prepared in neat boron alkoxide, the parent alcohol, benzene, pyridine, and/or ethylenediamine. The method of this invention has as its objective increasing the reactivity of methyl cellulose with boron alkoxides by treatment in solutions of strong bases, such as pyridine and ethylenediamine. Formation of methyl cellulose-boron alkoxide compounds modifies the rate of oxidation of methyl cellulose and is related to preparing flame-resistant products.

3,790,563
TETRAHYDRO DIAZEPINONES AND THEIR PREPARATION FROM HYDRAZINES AND δ-CARBONYLACIDS
Camille Georges Wermuth, Strasbourg, and Jean Cahn, Paris, France, assignors to Synthelabo, Paris, France
No Drawing. Filed Dec. 16, 1971, Ser. No. 208,957
Claims priority, application France, Dec. 16, 1970, 7045361
Int. Cl. C07d *53/02*
U.S. Cl. 260—239.3 R **8 Claims**

A hydrazine is reacted with a δ-carbonyl acid to provide 2,3,5,6-tetrahydro-4H-1,2-diazepine - 3 - ones of the formula



wherein

Ar is phenyl, tolyl, halophenyl, methoxyphenyl, naphthyl, or thienyl,

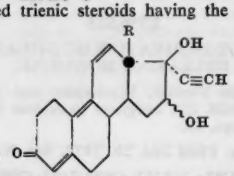
R is hydrogen, lower alkyl, carboxy(lower alkyl), di(lower alkyl)amino(lower alkyl), morpholino(lower alkyl) or pyrrolidino(lower alkyl), and each of R_1, R_2 and R_3 is independently hydrogen, lower alkyl, or a phenyl group,

and the pharmaceutically acceptable salts and quaternary ammonium derivatives thereof.

The compounds are useful in pharmaceutical chemistry, having been found particularly useful as psychotropic agents.

3,790,564
TRIENIC STEROIDS, PROCESS OF THEIR PREPARATION AND METHODS OF THEIR USE
André Pierdet, Noisy-le-Sec., and Geneviève Azadian, Paris, France, assignors to Roussel-UCLAF, Paris, France
No Drawing. Filed Aug. 15, 1972, Ser. No. 280,852
Claims priority, application France, Aug. 26, 1971, 7131032
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 C **9 Claims**

Ethynylated trienic steroids having the formula



wherein R represents alkyl having 1 to 3 carbon atoms and the ~OH in the 16 position is selected from the group consisting of the α-OH and the β-OH; as well as processes for the preparation of the compounds, intermediates in the process, therapeutic compositions containing the compounds and the method of preventing pregnancy in warm-blooded animals by administration of the compounds.

3,790,565
CEPHALOSPORIN C_A IMPROVED PROCESS
Peter W. Vanevenhoven, West Terre Haute, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
No Drawing. Filed Aug. 23, 1971, Ser. No. 174,213
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **3 Claims**

In a process for recovering cephalosporin C_A type antibiotics obtained by the general nucleophilic displacement

of the acetoxyl moiety of the crude cephalosporin C type starting compounds with the appropriate nucleophile in a heated, neutral aqueous solution of certain preferred halogen or —SCN salts, for example, in preparing cephaloridine from cephalothin, the product is nominally recovered in crude form by dilution and acidification to form the water-insoluble cephaloridine hydrothiocyanate salt. The claimed process improvement involves partial acidification wherein much of the colored, acidic degradation products are first converted to an insoluble, amorphous precipitate that is filtered prior to further acidifying the resulting filtrate, thereby permitting crystallization of an improved quality, lower-colored cephalosporin C_A type hydrothiocyanate salt.

3,790,566
CARBAMATE ESTERS OF 2-OXYIMINO-3-KETO-1,4-DIHETEROCYCLICS

Russell F. Bellina, Claymont, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 12, 1971, Ser. No. 171,388
Int. Cl. C07d *93/10*
U.S. Cl. 260—243 R **6 Claims**

Chemical compounds of the class of carbamate esters of 2-oxyimino-3-keto-1,4-diheterocyclics, such as 2-methylcarbamoyloxyimino-4-methyl - 3 - thiomorpholinone useful in controlling pests such as insects and nematodes.

3,790,567
CEPHALOSPORIN COMPOUNDS

James Kennedy, Montrose, Scotland, and Alan Gibson Long, Greenford, and William George Elphinstone, Underwood, Stokes Poges, England, assignors to Glaxo Laboratories Limited, Greenford, England

No Drawing. Original application Aug. 13, 1968, Ser. No. 752,191, now Patent No. 3,665,003. Divided and this application Dec. 28, 1971, Ser. No. 213,194
Claims priority, application Great Britain, Aug. 21, 1967, 38,493/67
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **3 Claims**

7β-acylaminodoceph-3-em-4-carboxylic acids having an etherified hydroxymethyl group at the 3-position and physiologically acceptable derivatives thereof. The compounds have utility as antibiotics and show absorption after oral administration.

3,790,568
PROCESS FOR PREPARING THIOAMINES

Joseph Edward Kerwood and Robert I. Leib, Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,944
Int. Cl. C07c *145/00;* **C07d** *51/70, 87/28*
U.S. Cl. 260—247.1 **16 Claims**

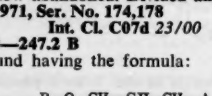
A process for preparing thioamines which comprises reacting a secondary amine or tertiary alkyl primary amine with a thioamide.

3,790,569
2-PROPANOL DERIVATIVES

Roland-Yves Mauvernay, Norbert Busch, Jacques Simond, and Jacques Moleyre, all of Route de Marsat, 63 Riom, France

No Drawing. Original application Aug. 1, 1968, Ser. No. 749,277, now abandoned. Divided and this application Aug. 23, 1971, Ser. No. 174,178
Int. Cl. C07d *23/00*
U.S. Cl. 260—247.2 B **4 Claims**

A compound having the formula:



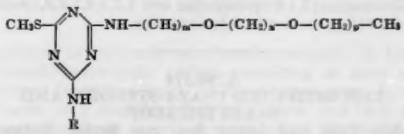
wherein R is an alkyl radical with 1 to 5 carbon atoms, an alkenyl radical, an alkynyl radical, or an arylalkyl radical, R_1 is phenyl, a methoxyphenyl, pyridyl, furyl, an arylalkyl radical, or an arylalkenyl radical, and A is morpholino, N-methylpiperazinyl, or N-benzylpiperazinyl. The compound has coronaro-dilatory and antiarrhythmic properties.

3,790,570
SUBSTITUTED DIAMINO-s-TRIAZINES

Jacques Perronnet, Paris, and Jean-Pierre Demoute, Montreuil-sous-Bois, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed Nov. 30, 1971, Ser. No. 203,450
Claims priority, application France, Dec. 10, 1970, 7044500
Int. Cl. C07d *55/20*
U.S. Cl. 260—249.8 **2 Claims**

Novel 1,3,5-triazines of the formula



(I)

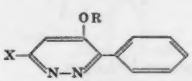
wherein R is a lower alkyl, *m* is 1 or 2, *n* is 1 or 2 and *p* is 0, 1 or 2 which have pre- and post-emergence herbicidal activity and their preparation.

3,790,571
PHENYLPYRIDAZINES

Alfred Diskus, Linz (Danube), Rupert Schonbeck, Leonding, near Linz (Danube), Engelbert Klomstein, Eferding, and Hubert Mayr, Leonding, near Linz (Danube), Austria, assignors to Osterreichische Stickstoffwerke Aktiengesellschaft, Linz (Danube), Austria

No Drawing. Filed June 9, 1972, Ser. No. 261,331
Claims priority, application Germany, June 11, 1971, P 21 29 109.8
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 A **5 Claims**

Phenylpyridazine compounds having the general formula:



in which X is Cl or Br and R is H, —CH_3 or —CH_3CO, a process for their preparation and herbicidal compositions containing them.

3,790,572
2-HYDROXYALKYL-4,5-DIHYDROPYRIDAZIN-3(2H)-ONE DERIVATIVES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 242,796, Apr. 10, 1972, which is a continuation-in-part of application Ser. No. 178,815, Sept. 8, 1971, both now abandoned. This application Aug. 14, 1972, Ser. No. 280,670
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 A **9 Claims**

Derivatives of 2-hydroxyalkyl-6-aryl or heterocyclic substituted-4,5-dihydropyridazin - 3(2H) - ones, e.g., 6-(p-chlorophenyl) - 2 - (2-N-methylcarbamoyloxybutyl)-4,5-

dihydropyridazin-3(2H)-one are prepared by reacting 2-hydroxyalkyl - 6 - substituted - 4,5 - dihydropyridazin-3(2H)-ones with organic acid halides or anhydrides, isocyanates, dihydrofuran or dihydropyran or by treating 2-alkoxycarbonyl halide-6-substituted-4,5-dihydropyridazin-3(2H)-one with amines and are useful as central nervous depressants.

3,790,573
IMIDAZO AND PYRIMIDO[2,1-b]QUINAZOLINES

Dale W. Blackburn, Moorestown, N.J., and Robert F. Devenney, Newtown Square, and Timothy Yu-Wen Jen, Broomall, Pa., assignors to Smithkline Corporation, Philadelphia, Pa.

No Drawing. Filed Nov. 11, 1971, Ser. No. 197,916
Int. Cl. C07d *51/48*
U.S. Cl. 260—256.4 F **8 Claims**

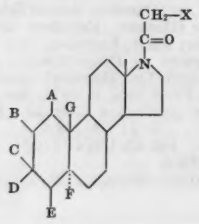
The compounds are hexahydro, octahydro and decahydro imidazo[2,1-b]quinazolines and pyrimido[2,1-b] quinazolines which have hypotensive activity. For example, compounds of this invention are 1,2,3,5,6,7,8,9-octahydroimidazo[2,1-b]quinazoline and 1,2,3,4,7,8,9,10-octahydro-6H-pyrimido[2,1-b]quinazoline.

3,790,574
21-SUBSTITUTED 17-AZA-STEROIDS AND SALTS THEREOF

Zoltán Tuba and Mária Bor, nee Szabó, Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

No Drawing. Filed June 14, 1971, Ser. No. 152,970
Claims priority, application Hungary, June 18, 1970, RI–396
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 PC **6 Claims**

This invention relates to 21-substituted 17-aza-steroids and salts thereof having the Formula I



(I)

wherein

A and B each represent hydrogen,
C is hydroxy group, ester or ether,
D, E and F each represent hydrogen atom,
G is a methyl group if the compounds are of androstane type, or
A and B, D and E and F and G each represent termini of double bond, or
C and D represent together an oxo-group, especially a ketal group, and
X represents chlorine, bromine, hydroxy or acyloxy a substituted, secondary or tertiary amino.

3,790,575
QUINACRIDONE PIGMENTS

Frederick J. Hafele, Paterson, N.J., and Hugh M. Smith, Staten Island, N.Y., assignors to Sun Chemical Corporation, New York, N.Y.

No Drawing. Filed Jan. 11, 1971, Ser. No. 105,606
Int. Cl. C07d *39/00*
U.S. Cl. 260—279 R **7 Claims**

The properties of quinacridones are improved by contacting the crude non-pigmentary quinacridone with a mixture of aqueous sulfuric acid and xylene sulfonic acid, drowning the product in a water-miscible organic diluent, and recovering the pigment product.

3,790,576
9 SUBSTITUTED 4,9-DIHYDRO-1,3,4,4-TETRA-ALKYL-1H-PYRAZOLO[3,4-b]QUINOLINES

Horace A. De Wald, Ann Arbor, Mich., assignor to Parke Davis & Company, Detroit, Mich.

No Drawing. Filed Mar. 20, 1972, Ser. No. 236,459
Int. Cl. C07d *33/52*
U.S. Cl. 260—286 R **10 Claims**

4,9 - dihydro-1H-pyrazolo[3,4-b]quinoline compounds, substituted in the 1-position by alkyl or 2-hydroxyethyl, in the 3- and 4-positions by methyl or ethyl, optionally in the 6- or 7-position by methyl, chloro, fluoro, methoxy, or methylthio, and optionally in the 9-position by a 3-(amino, methylamino, or dimethylamino)propyl group or a 3-(dimethylamino)propyl, N-oxide group; salts thereof; and their production by (a) cyclizing an o-[(pyrazol-5-yl)-amino]-α,α-dialkylbenzyl alcohol, (b) reacting an alkali metal salt of one of the 9-unsubstituted compounds with a 3-(dimethylamino)propyl halide, (c) reacting a 9-(3-halopropyl)-intermediate with methylamine, (d) reducing a 9-(3-azidopropyl)-intermediate, and (e) reacting one of the 9-[3-(dimethylamino)propyl]-compounds with an oxidizing agent. The compounds are useful as intermediates and as antidepressant agents.

3,790,577
PYRIDOQUINOLINE DICARBOXYLIC ACID DERIVATIVES

Wilson Shaw Waring, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing Filed Sept. 13, 1971, Ser. No. 180,233
Claims priority, application Great Britain, Oct. 5, 1970, 47,151/70; Nov. 18, 1970, 54,868/70; Feb. 22, 1971, 5,096/71
Int. Cl. C07d *39/14*
U.S. Cl. 260—287 R **8 Claims**

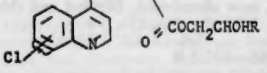
Dicarboxylic acid derivatives of 1,7-phenanthroline, 4,7-phenanthroline, pyrido[2,3-g]quinoline and pyrido-[3,2-g]quinoline, processes for their preparation, and pharmaceutical compositions. A representative compound is 2,8-diethoxycarbonyl-4,10-dihydroxy-6 - methyl - 1,7-phenanthroline. Compounds active against syndromes or diseases initiated by an antigen-antibody reaction.

3,790,578
DERIVATIVES OF 2,3-DIHYDROXYPROPYL-N-(7 OR 8-CHLORO-4-QUINOLINYL)ANTHRANILATE

Robert John Theriault, Kenosha, Wis., and James Paul Karwowski, Mundelein, and Norman Earl Wideburg, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed Oct. 19, 1971, Ser. No. 190,690
Int. Cl. C07d *33/38*
U.S. Cl. 260—287 R **3 Claims**

Novel derivatives of 2,3-dihydroxypropyl-N-(7 or 8-chloro-4-quinolinyl)anthranilate. The compounds are represented by the formula



wherein the chloro is in the 7- or 8-position and R is $—CH_2OCH_3$. The compounds are prepared by microbial transformation of 2,3-dihydroxypropyl-N-(7- or 8-chloro-4-quinolinyl)anthranilate. The compounds are useful as

analgesic and anti-inflammatory agents these are prepared by fermentations employing NRRL–3941, Basidiomycete species F–55.

3,790,579

1-OXA-2,4,8-TRIAZASPIRO[4,5]DEC-2-ENES

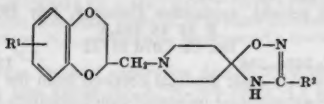
Michio Nakanishi, Nakatsu, Katsuo Arimura, Yoshitomimachi, and Hideki Ao, Nakatsu, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

No Drawing. Filed Aug. 19, 1971, Ser. No. 173,327 Claims priority, application Japan, Aug. 19, 1970, 45/72,932

Int. Cl. C07d *85/52*

U.S. Cl. 260—293.58 **13 Claims**

1-oxa-2,4,8-triazaspiro[4,5]dec-2-enes of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R^1 is H, Cl, CH_3 or OCH_3; and R^2 is an alkyl group of from 1 to 3 carbon atoms, a benzyl group, a phenyl group and a substituted phenyl group in which the substituent is selected from the group consisting of Cl, CH_3 and OCH_3. These compounds are useful as vasodilators and can be prepared by reacting a functional derivative of the corresponding benzodioxanylmethanol with the corresponding new oxatriazaspirodecene.

3,790,580

BIS-4-OXO-4H-1-BENZOPYRANS

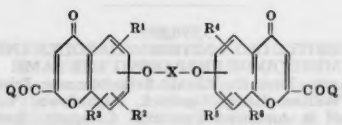
Peter Bennett Johnson and Thomas Brian Lee, Loughborough, England, assignors to Fisons Limited, London, England

No Drawing. Filed Sept. 2, 1971, Ser. No. 177,510 Claims priority, application Great Britain, Sept. 3, 1970, 42,132/70, 42,133/70

Int. Cl. C07d *7/32*

U.S. Cl. 260—293.58 **8 Claims**

There are described compounds of Formula I,



in which

R^1, R^2, R^3, R^4, R^5 and R^6 are the same or different and each represent hydrogen, halogen, hydroxy, alkyl or alkoxy, or substituted alkyl or alkoxy,

X is an optionally substituted, straight or branched hydrocarbon chain which may be interrupted by a carbocyclic or heterocyclic ring, or one or more oxygen atoms or carbonyl groups, and

COQ is a basic amide or a basic ester group.

3,790,581

N-{1-[3-CYANO - 3,3 - BIS(OPTIONALLY SUBSTITUTED PHENYL)PROPYL] - 4-PHENYLPIPERIDINE-4-CARBONYLOXY}SUCCINIMIDES

Eunice M. Kreider, Chicago, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of abandoned application Ser. No. 262,325, June 13, 1972. This application Aug. 17, 1972, Ser. No. 281,441

Int. Cl. C07d *29/32*

U.S. Cl. 260—293.71 **5 Claims**

Preparation of the subject compounds by reaction of 1-[3-cyano-3,3-bis(optionally substituted phenyl)propyl]-4-phenylpiperidine-4-carboxylic acid with an N-hydroxy compound of the type

wherein

represents an optionally substituted monocyclic- or fused polycyclic-heterocyclic radical containing at least one carbonyl function adjacent to the nitrogen atom, in the presence of a suitable dehydrating agent, and their unexpected utility as narcotic antagonists are disclosed.

3,790,582

CERTAIN PYRIDYLPHOSPHATES, THIOPHOSPHATES, PHOSPHONATES AND THIOPHOSPHONATES

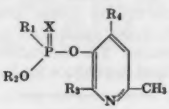
Daniel Demozay, Villeurbanne, and Daniel Pillon and Jacques Ducret, Lyon, France, assignors to Pepro, Societe pour le Developpement et la Vente de Specialites Chimiques, Lyon, France

No Drawing. Filed June 28, 1971, Ser. No. 157,636 Claims priority, application France, June 30, 1970, 7024078

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 K **9 Claims**

Phosphoric derivatives containing substituted methylpyridines and having the general formula



and their use in insecticidal, acaricidal and nematicidal compositions.

3,790,583

CERTAIN [3-(4 - PHENYL)-1-(2H) 3,6 - DIHYDROPYRIDYL]-PROPYL(THIO)-ANILIDES, SULFONAMIDO ANILIDES, ANILINES AND DERIVATIVES THEREOF

Albrecht Edenhofer, Riehen, and Hans Spiegelberg, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Dec. 4, 1969, Ser. No. 882,298, now Patent No. 3,674,799, dated July 4, 1972. Divided and this application Mar. 23, 1972, Ser. No. 237,539

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 G **6 Claims**

Substituted [3-(4-phenyl - 1 - hydropyridyl)-propoxy or propylthio]anilines prepared, inter alia, by reacting the

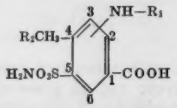
correspondingly substituted propoxy or propyl-thio anilines and N-phenyl-hydropyridines, are described. The end products, i.e., the substituted [3-(4-phenyl - 1 - hydropyridyl)propoxy or propylthio]anilines are useful as antiphlogistic, antiallergic, antitussive and analgesic agents.

3,790,584
SULFAMYLBENZOIC ACIDS

Peter Werner Feit, Gentofte, and Ole Bent Tvaermose Nielsen, Vanlose, Denmark, assignors to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

No Drawing. Original application June 16, 1971, Ser. No. 153,879. Divided and this application Sept. 15, 1972, Ser. No. 288,765
Int. Cl. C07d *31/48*
U.S. Cl. 260—294.8 F **3 Claims**

The invention relates to a series of new compounds, their salts and esters and to methods for the preparation of the compounds having the general formula:



in which the NH—R_1 group can be in the 2- or 3-position, R_1 represents an aliphatic radical with from 3 to 8 carbon atoms in the chain, or a mononuclear aromatically or a mononuclear heterocyclically substituted methyl or ethyl group, and R_2 represents an unsubstituted or substituted phenyl group.

3,790,585
MANUFACTURE OF BIPYRIDYLIUM SALTS

John Edward Colchester and Thomas Blundell, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed June 16, 1969, Ser. No. 833,709
Claims priority, application Great Britain, July 1, 1968, 31,365/68; Sept. 11, 1968, 43,147/68; Oct. 8, 1968, 47,585/68; Nov. 1, 1968, 51,850/68; Nov. 23, 1968, 61,012/68; Feb. 17, 1969, 8,509/69
Int. Cl. C07d *31/44*
U.S. Cl. 260—295 AM **22 Claims**

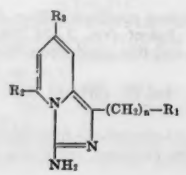
A process for the manufacture of a 1,1'-disubstituted-4,4'-bipyridylium salt wherein each of the substituents contains up to 10 carbon atoms which comprises reacting and N-substituted pyridinium salt with a cyanide under basic conditions. The interaction product is then subsequently oxidized to produce the bypyridylium salt.

3,790,586
IMIDAZO-PYRIDINE DERIVATIVES

Tsutomu Irikura, Kazunori Kasuga, and Taeko Hashizume, Tokyo, Mitsuo Ohashi, Ageo, Masuo Yuge, Urawa, and Michiko Yamada, Tokyo, Japan, assignors to Kyorin Seiyaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Feb. 29, 1972, Ser. No. 230,506
Claims priority, application Japan, Mar. 15, 1971, 46/14,159
Int. Cl. C07d *31/42*
U.S. Cl. 260—296 H **12 Claims**

The present invention provides 3-amino-imidazo[1,5-a]-pyridines expressed by the general formula,



(I)

(wherein: R_1 is a hydrogen atom, a phenyl group, a halogen-substituted phenyl group, or a lower straight or branched alkyl-substituted phenyl group; R_2 is a hydrogen atom, a halogen atom, or a lower straight or branched alkyl group; R_3 is a hydrogen atom, a halogen atom, a lower straight or branched alkyl group, an amino group, or an acetoamido group; and n is 0 or 1), and acid addition salts thereof.

The substances of this invention expressed by the general Formula I exhibit excellent gastric antisecretory action without an anticholinergic effect.

3,790,587
ANTIMYCOTIC BENZISOTHIAZOLINE DERIVATIVES

Horst Boshagen, Haan, and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of applications Ser. No. 566,199, July 19, 1966, and Ser. No. 783,756, Dec. 13, 1968, both now abandoned. This application June 10, 1971, Ser. No. 151,929
Claims priority, application Germany, July 29, 1965, P 15 45 844.3
Int. Cl. C07d *91/12*
U.S. Cl. 260—304 **15 Claims**

The weakly basic products obtained from the reaction of an N-substituted-3-halogenobenziothiazolium halogenide and ammonia, and the salts of these products with strong acids, possess antimycotic properties. The substituents on the nitrogen atom of the 3-halogenoisothiazolium halogenide can be alkyl group of 1 to 7 carbon atoms, benzyl, cyclohexyl, methylcyclohexyl, phenyl or phenyl substituted by halogen, nitro, lower alkyl, nitro, lower alkyl, lower alkoxy or di-(lower alkyl) amino. A typical embodiment is the hydrochloride salt of the product obtained from 2-methyl-3-chlorobenzisothiazolium chloride and ammonia, said hydrochloride being colorless prisms and having the empirical formula $C_8H_8NS.HCl$ with a melting point of 220° C.

3,790,588
METHOD OF MANUFACTURING DIALKYLAMINO - 1,3,4 - OXADIAZOLES AND 1,3,4-THIADIAZOLES

Norman A. Dahle, Mission, Kans., assignor to Gulf Research and Development Company, Pittsburgh, Pa.

No Drawing. Filed Oct. 24, 1969, Ser. No. 869,385
Int. Cl. C07d *85/54, 91/62*
U.S. Cl. 260—306.8 D **6 Claims**

5-substituted tetrazoles are reacted with N,N-dialkyl carbamyl chlorides or corresponding thiocarbamyl chlorides and the reaction products are heated to produce 2-dialkylamino-5-substituted-1,3,4-oxadiazoles and thiadiazoles by decomposition and molecular rearrangement. The products are useful as selective herbicides.

3,790,589
SUBSTITUTED 5-NITROIMIDAZOLES AND METHOD OF PREPARING THE SAME

Goro Asato, Titusville, Gerald Berkelhammer, Princeton, and William Henry Gastrock, Hightstown, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Application Oct. 2, 1969, Ser. No. 863,378, now Patent No. 3,649,638, which is a continuation-in-part of abandoned application Ser. No. 766,984, Oct. 11, 1968. Divided and this application Nov. 26, 1971, Ser. No. 202,568
Int. Cl. C07d *91/62*
U.S. Cl. 260—306.8 D **3 Claims**

This invention relates to new chemical compounds of the class 1-substituted-5-nitro-2-substituted imidazoles and methods for the preparation thereof. These compounds are useful for their anti-microbial activity.

3,790,590

2-AMINO - 1,3,4 - THIADIAZOLE-5-CARBOXALDEHYDE OXIME AND 2-ACETAMIDO-1,3,4-THIADIAZOLE-CARBONITRILE

William Alan Remers, West Lafayette, Ind., Gabriel Joseph Gibs, Pearl River, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Application Oct. 30, 1970, Ser. No. 85,736, now Patent No. 3,700,684, which is a continuation-in-part of application Ser. No. 766,986, Oct. 11, 1968, now Patent No. 3,564,002. Divided and this application Feb. 24, 1972, Ser. No. 229,151

Int. Cl. C07d *91/62*

U.S. Cl. 260—306.8 D 2 Claims

The preparation of 2-amino or substituted amino-5-substituted thiadiazoles are described. They are useful as intermediates for the preparation of, for example, 2-(2-amino-5-1,3,4-thiadiazolyl)-1-methyl - 5 - nitroimidazole which has anti-protozoal and anti-bacterial properties.

3,790,591

INTERMEDIATE 4-METHOXY ISOXAZOLES

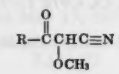
Harry Allen Albrecht, Towaco, and John Thomas Plati, Rutherford, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Aug. 6, 1970, Ser. No. 61,785, now Patent No. 3,706,761, which is a division of application Ser. No. 682,551, Nov. 13, 1967, now Patent No. 3,547,973, which in turn is a division of application Ser. No. 446,068, Apr. 6, 1965, now Patent No. 3,400,122. Divided and this application Aug. 11, 1972, Ser. No. 279,917

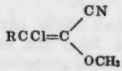
Int. Cl. C07d *85/44*

U.S. Cl. 260—307 H 2 Claims

Antibacterial N^1-(4-methoxy-3-alkyl-5-isoxazolyl)-sulfanilamides, N^1-(4-methoxy-5-alkyl-3-isoxazolyl)sulfanilamides and their base addition salts with pharmaceutically acceptable bases are described. The N^1(4-methoxy-3-alkyl-5-isoxazolyl)sulfanilamides are prepared from the sequential intermediates 4-methoxy-5-alkylisoxazole,



wherein R is hydrogen or lower alkyl, and 5-amino-4-methoxy-3-alkylisoxazole. The N^1-(4-methoxy-5-alkyl-3-isoxazolyl)sulfanilamides are prepared from the sequential intermediates



wherein R is hydrogen or lower alkyl, and 3-amino-4-methoxy-5-alkylisoxazole.

3,790,592

1-SUBSTITUTED-5-NITROIMIDAZOL-2-YLALKYL-(N-SUBSTITUTED)-CARBAMATES

John A. Carlson, Mead Road, R.F.D. 2, Nassau, N.Y. 12123; Dale R. Hoff, 2 Kings Ridge Road, R.F.D. 1, Basking Ridge, N.J. 07920; and Clarence S. Rooney, 416 Fletchers Road, Beaconsfield, Quebec, Canada

No Drawing. Application Sept. 5, 1969, Ser. No. 855,769, now Patent No. 3,646,027, dated Feb. 29, 1972, which is a continuation-in-part of application Ser. No. 550,932, May 18, 1966, which in turn is a continuation-in-part of application Ser. No. 470,239, July 7, 1965, both now abandoned. Divided and this application Nov. 12, 1971, Ser. No. 198,432

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 8 Claims

1-substituted-5-nitroimidazol-2-ylalkyl carbamates containing N-alkoxy, alkanoyloxy, or benzoyloxy substituents, and acid addition salts thereof are prepared from 1-substituted-5-nitroimidazoles having at the 2-position of the imidazole ring a hydroxyalkyl, mercaptoalkyl, haloalkyl, halocarbonylalkyl or halothiocarbonyloxyalkyl radical. The 1-substituted - 5 - nitroimidazol-2-ylalkyl-(N-substituted)-carbamates are useful in the treatment of parasitic diseases. Antiparasitic compositions in which the active ingredient is a 1-substituted-imidazol-2-ylalkyl-(N-substituted)-carbamate are also provided.

3,790,593

1-SUBSTITUTED-5-NITROIMIDAZOL-2-YLALKYL-(N-SUBSTITUTED)-CARBAMATES

John A. Carlson, Mead Road, R.F.D. 2, Nassau, N.Y. 12123; Dale R. Hoff, 2 Kings Ridge Road, R.F.D. 1, Basking Ridge, N.J. 07920; and Clarence S. Rooney, 416 Fletchers Road, Beaconsfield, Quebec, Canada

No Drawing. Application Sept. 5, 1969, Ser. No. 855,765, now Patent No. 3,646,027, dated Feb. 29, 1972, which is a continuation-in-part of application Ser. No. 550,932, May 18, 1966, which in turn is a continuation-in-part of application Ser. No. 470,239, July 7, 1965, both now abandoned. Divided and this application Nov. 12, 1971, Ser. No. 198,440

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 8 Claims

1-substituted-5-nitroimidazol-2-ylalkyl carbamates containing N-amino or N-substituted amino substituents, and acid addition salts thereof are prepared from 1-substituted-5-nitroimidazoles having at the 2-position of the imidazole ring an hydroxyalkyl, mercaptoalkyl, haloalkyl, halocarbonylalkyl or halothiocarbonyloxyalkyl radical. The 1 - substituted-5-nitroimidazol-2-ylalkyl-(N-substituted)-carbamates are useful in the treatment of parasitic diseases. Antiparasitic compositions in which the active ingredient is a 1-substituted imidazol-2-ylalkyl-(N-substituted)-carbamate are also provided.

3,790,594

THIENYL-IMIDAZOLYL ALKANOIC ACIDS

Werner Meiser, Carl Metzger, Karl Heinz Buchel, and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Nov. 24, 1971, Ser. No. 201,981

Claims priority, application Germany, Dec. 5, 1970, P 20 59 949.9

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 14 Claims

Derivatives of alkanoic acids bearing a thienyl group and an imidazolyl group on a common carbon atom and optionally being further substituted on the same carbon atom are antimycotic agents. The compounds, of which methyl dithienyl-imidazolylacetate is a representative embodiment, are obtained from the corresponding thienyl halo or hydroxy alkanoic acid derivative and imidazole, a salt thereof or reactive derivative thereof.

3,790,595

4-SUBSTITUTED-5,7-DINITRO-2-(α,α-DIFLUOROALKYL)BENZIMIDAZOLE COMPOUNDS

John L. Miesel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of abandoned application Ser. No. 833,685, June 16, 1969. This application Jan. 28, 1972, Ser. No. 221,809

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 10 Claims

4-substituted-5,7-dinitro - 2 - (α,α-difluoroalkyl)benzimidazole compounds and their alkali metal and alkaline earth metal salts, useful as insecticides.

3,790,596

METHOD OF PRODUCING INDOLE AND SUBSTITUTION PRODUCTS OF THE SAME

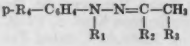
Nikolai Nikolaevich Suvorov, 3 ulitsa Frunzenskaya 6, kv. 172; Vladimir Grigorievich Avramenko, ulitsa Kondratyuka 14, kv. 50; Valentina Nikolaevna Shkilkova, 2 Pereyaslavsky pereulok 9, kv. 12; and Lidia Ionovna Zamyshlyaeva, Novolesnaya ulitsa 18, korpus 1, kv. 7, all of Moscow, U.S.S.R.

No Drawing. Continuation-in-part of abandoned application Ser. No. 712,361, Mar. 12, 1968. This application May 14, 1971, Ser. No. 143,644

Int. Cl. C07d *27/56*

U.S. Cl. 260—319.1 8 Claims

A method of producing indole and its derivatives consisting in that an arylhydrazone having the general formula



where R_1 and R_2 are hydrogen or methyl, R_3 is hydrogen or ethyl, and R_4 is hydrogen or chlorine, bromine, methyl or methoxy, is catalyzed in the vapor phase over aluminum oxide at a temperature of 300–400° C.

3,790,597

SULFUR DERIVATIVES OF ALKYLHYDROXYPHENYL MALEIMIDES AND COMPOSITIONS THEREOF

Martin Dexter, Briarcliff Manor, and Martin Knell, Ossining, N.Y., and Hans Jakob Peterli, Fullinsdorf, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Apr. 12, 1971, Ser. No. 133,448

Int. Cl. C07d *27/10*

U.S. Cl. 260—326.5 S 7 Claims

Novel sulfur derivatives of alkylhydroxyphenyl maleimides were prepared. The alkyl-hydroxyphenyl maleimides were prepared by first reacting an alkylhydroxyphenyl amine with maleic anhydride with subsequent cyclization of the maleamic acid to obtain the corresponding maleimide. The sulfur containing derivatives of the alkylhydroxyphenyl maleimide is prepared by reacting the corresponding maleimide with an appropriate mercaptan or dimercaptan compound. The compounds of this invention are useful as stabilizers of organic materials which are subject to oxidative and thermal deterioration.

3,790,598

PROCESS FOR PREPARING α-AMINO ACIDS

Ralph A. Damico, Colerain Township, Hamilton County, and Robert G. Laughlin, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Dec. 19, 1969, Ser. No. 886,748

Int. Cl. C07c *99/00, 101/00*

U.S. Cl. 260—326.14 T 15 Claims

Process for preparing α-amino acids comprising reacting an isocyano acetate ester or salt with a strongly basic metalating agent to provide an α-metalated isocyano ester or salt carbanion, reacting said α-metalated isocyano ester or salt carbanion with an electrophilic reagent to provide an α-substituted isocyano acetate ester or salt; and thereafter hydrolyzing said α-substituted isocyano ester or salt to provide an α-amino acid.

3,790,599

PREPARATION OF α-AMINOACIDS FROM HYDANTOINS

Jean Louis Zundel, 30 Rue Pierre Geofroix, Colombes (Hauts-de-Seine), France

No Drawing. Filed June 10, 1970, Ser. No. 45,270

Claims priority, application Great Britain, June 10, 1969, 29,350/69

Int. Cl. C07d *27/52;* C07c *99/00, 101/00*

U.S. Cl. 260—326.14 T 14 Claims

Alpha-amino acids are produced by hydrolyzing hydantoins with a strong base in the presence of an acid having a dissociation constant of 1×10^{-2} to 1×10^{-12}.

3,790,600

2-(3 - BENZO[b]THENYL) - 2 - THIOPSEUDOUREA AND ITS PHARMACEUTICALLY ACCEPTABLE SALTS

Zaven S. Ariyan, Woodbury, Conn., and Shih-Yu Ma, Wayne, N.J., assignors to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Apr. 6, 1972, Ser. No. 241,837

Int. Cl. A61k *27/00;* C07d *63/22*

U.S. Cl. 260—330.5 2 Claims

2-(3-benzo[b]thenyl)-2-thiopseudourea and its pharmaceutically acceptable salts are a new group of compounds which are useful as anti-aggression agents.

3,790,601

1,3-BENZODIOXOL-2-THIONES, PROCESS OF MANUFACTURE AND METHOD OF USE

Jean-Jacques Gallay, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

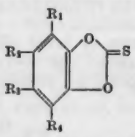
No Drawing. Filed Jan. 26, 1971, Ser. No. 109,976

Claims priority, application Switzerland, Jan. 30, 1970, 1,387/70

Int. Cl. C07d *13/10*

U.S. Cl. 260—340.5 8 Claims

1,3-benzodioxol-2-thiones of the formula



their manufacture, their utility against parasitic nematodes phytopathogenic fungi and representatives of the order Acarina and biocidal preparations containing them are disclosed. In this formula, R_1 and R_2 each is hydrogen or halogen; R_3 is hydrogen, halogen, iso-thiocyanate, lower alkyl or the radical-COR, wherein R stands for lower alkyl, lower halogenalkyl, lower alkoxy, phenoxy or anilino; and R_4 is hydrogen, halogen or lower alkoxy; the proviso is that at least one of R_1 to R_4 is different from hydrogen.

3,790,602

ACCELERATED PROCESS FOR DIARYL SULFONE GLYCIDYL ETHERS

Claire Bluestein, Glen Rock, N.J., William Rosenblatt, Pearl River, N.Y., and John R. Clark, Nutley, N.J., assignors to Witco Chemical Corporation, New York, N.Y.

No Drawing. Filed Mar. 31, 1972, Ser. No. 239,986

Int. Cl. C07d *1/04*

U.S. Cl. 260—348.6 5 Claims

An improved accelerated process for preparing glycidyl ethers of polyhydric phenols, particularly those polyhy-

dric phenols which are substantially insoluble in epichlorohydrin, such as bis(4-hydroxyphenyl)sulfone (bisphenol-S), by refluxing a mixture of the polyhydric phenol in excess epichlorohydrin in the presence of a catalytic amount of an alkali metal salt of a weak carbon containing acid having from 1 to 4 carbon atoms, such as sodium or potassium formate or acetate, for instance, to accelerate the formation of the soluble adduct in epichlorohydrin. The resultant solution of the adduct of polyhydric phenol and epichlorohydrin in epichlorohydrin solution is treated with a stoichiometric excess of alkali metal hydroxide while refluxing, to form the glycidyl ether product which is useful in making films, castings, coatings, adhesives and the like.

3,790,603

6,14-DICHLOROPYRANTHRONE

Fritz Graser, Ludwigshafen, and Gustav Bock, Neustadt, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

No Drawing. Filed Feb. 16, 1971, Ser. No. 115,826

Claims priority, application Germany, Feb. 20, 1970, P 20 07 848.2

Int. Cl. C09b *3/42*

U.S. Cl. 260—360 **1 Claim**

6,14 - dichloropropyranthrone and a process for its manufacture from 3,3'-dichloro-2,2'-dimethyl-1,1'-dianthraquinoyl.

6,14-dichloropyranthrone is a pigment dye having excellent coloristic properties.

3,790,604

ANTHRAQUINONE COMPOUNDS

Ian Cheetham, Kenneth Dunkerley, Colin William Greenhalgh, and Duncan Adrian Sidney Phillips, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

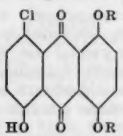
No Drawing. Filed May 19, 1972, Ser. No. 254,861

Claims priority, application Great Britain, Feb. 18, 1972, 7,543/72

Int. Cl. C09b *1/10, 1/14*

U.S. Cl. 260—383 **1 Claim**

The anthraquinone compound of the formula:



wherein R is hydrogen or lower alkyl, a process for the manufacture of the said compounds, and the use of the said compounds as dyestuffs intermediates.

3,790,605

17α-ETHYNYLESTRIOL 3-CYCLOPENTYL ETHER

Russell J. Kraay and Eugene Farkas, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of abandoned application Ser. No. 127,690, Mar. 24, 1971. This application Apr. 23, 1971, Ser. No. 136,671

Int. Cl. C07c *169/08*

U.S. Cl. 260—397.5 **1 Claim**

17α-ethynylestriol 3-cyclopentyl ether, estrogenic hormone useful in treatment of menopausal syndrome and all other conditions of estrogen deficiency or in which estrogens may be used therapeutically.

3,790,606

ALKOXYLATED MANNICH COMPOSITIONS AND DERIVATIVES THEREOF

Lucien Sellet, Saddle River, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Continuation-in-part of application Ser. No. 573,789, Aug. 22, 1966. This application Sept. 30, 1970, Ser. No. 76,988

Int. Cl. C07c *141/04;* **C14c** *11/00;* **D06m** *13/46*

U.S. Cl. 260—401 **2 Claims**

Treating agents are prepared by condensing Mannich Base compounds with alkylene oxide and thereafter reacting the alkoxylated compounds with quaternizing reagents. Mannich Base compounds are obtained by condensation of phenols with aldehydes and alkanolamines.

3,790,607

CARBONYLATION OF FLUOROCARBON IODIDES

Bernard Murray Lichstein, Elizabeth, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed May 20, 1971, Ser. No. 145,564

Int. Cl. C07c *51/00, 51/54, 67/00*

U.S. Cl. 260—408 **14 Claims**

This invention provides a direct method for carbonylation of fluorocarbon compounds without loss of fluorine substituents. The method comprises reacting a fluorocarbon iodide with carbon monoxide and an active-hydrogen containing compound, such as methanol, in the presence of a metal carbonyl catalyst.

3,790,608

PROCESS FOR PREPARING EDIBLE FATS BY HYDROGENATION AND FRACTIONATION OF TRIGLYCERIDE FATTY OILS CONTAINING C_{20} AND C_{22} FATTY ACIDS

Brian Leonard Caverly, Meopham, England, Gerard Joseph Hendrik Meertens, Eindhoven, Netherlands, and John Barry Rossell, St. Albans, England, assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 749,970, Aug. 5, 1968. This application July 23, 1971, Ser. No. 165,703

Claims priority, application Great Britain, Aug. 9, 1967, 36,657/67

Int. Cl. A23d *5/00;* **C11c** *3/12*

U.S. Cl. 260—409 **18 Claims**

A hard stearine butter for confectionery is prepared from a triglyceride oil containing mono- and poly-ethenoic acids of which 25 to 85% by weight of total fatty acids are unsaturated C_{20} and C_{22} acids, for instance a rapeseed or other crucifera oil, by selective hardening to an iodine value of between 70 and 85 with isomerization to a trans index of between 50 and 80, and fractionation to isolate a fat fraction of D_{20} at least 1400 and D_{35} below 300.

3,790,609

CARBOXYLIC, HYDROXY-CARBOXYLIC AND RELATED ACID MIXTURES

Joseph Z. Pasky, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Jan. 29, 1971, Ser. No. 111,143

Int. Cl. C09f *5/10*

U.S. Cl. 260—413 **8 Claims**

Mono- and dibasic carboxylic acid mixtures containing an organic hydroxy-acid component are purified by con-

tacting the mixture in the liquid phase with an alkylatable arene and hydrogen fluoride at a temperature within the 0° C. to 80° C. range.

3,790,610

ORGANIC POLYMER CHELANTS FOR IRON AND MANGANESE IONS

John C. Lum, Union, N.J., and Ronald F. Beyer, Concord, Calif., assignors to Colloids, Inc., Newark, N.J.

No Drawing. Filed Sept. 7, 1971, Ser. No. 178,119
Int. Cl. C07f 13/00, 15/02
U.S. Cl. 260—429 J 5 Claims

Process for soluble polymeric chelates of iron and manganese which comprises reacting iron and/or manganese ions with polymers and copolymers based on organic monomeric acids, the polymers and copolymers preferably having relatively low molecular weights of less than 50,000, the chelation process being applicable at a wide range of pH values of the ion containing solution, compositions of polymeric chelates prepared thereby, and uses therefor.

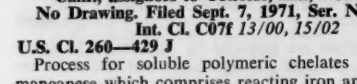
3,790,611

TRIS(CYCLOHEXYLALKYL)TIN OR HEXAKIS (CYCLOHEXYLALKYL)TIN COMPOUNDS

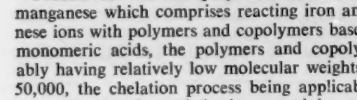
Melvin H. Gitlitz and Bernard G. Kushlefsky, Edison, N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

No Drawing. Filed Oct. 5, 1972, Ser. No. 295,137
Int. Cl. C07f 7/22
U.S. Cl. 260—429.7 5 Claims

Triorganotin compounds of the general formulae



and



are novel and effectively combat a variety of undesirable organisms, including fungi and mites when applied to objects, particularly plants, that are susceptible to attack by these organisms. In the foregoing formulae each R is individually selected from hydrogen and lower alkyl radicals, X is a chlorine, bromine, fluorine, hydroxyl, carboxylate, phenoxy, alkoxy (—OR′) or mercaptide (—SR′) radical wherein R′ represents an alkyl or aryl radical containing between 1 and 12 carbon atoms, inclusive; Y is an oxygen, sulfur, or a sulfate radical and *n* represents an integer between 1 and 5, inclusive.

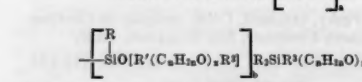
3,790,612

ORGANOPOLYSILOXANE COPOLYMER USEFUL AS SURFACTANT

William J. Raleigh, Watervliet, N.Y., assignor to General Electric Company

No Drawing. Original application May 27, 1970, Ser. No. 41,067, now Patent No. 3,654,195. Divided and this application Oct. 14, 1971, Ser. No. 189,446
Int. Cl. C07f 7/08
U.S. Cl. 260—448.2 B 5 Claims

An organopolysiloxane copolymer of the formula,



wherein R, R^2 are lower monovalent hydrocarbon radicals, R′ and R^3 are lower divalent hydrocarbon radicals, *a* has a value of at least 4, *b* has a value of at least 1, *n* has a value of from 2 to 4 and *x* has a value of at least 5.

3,790,613

ORGANOSILICON COMPOUND WITH ISOTHIOCYANATE SUBSTITUENT BONDED THROUGH DIVALENT BRIDGE

Abe Berger, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Application June 9, 1971, Ser. No. 151,549, which is a continuation-in-part of application Ser. No. 796,647, Jan. 31, 1969, now Patent No. 3,646,089. Divided and this application June 23, 1972, Ser. No. 266,516
Int. Cl. C07f 7/08, 7/18
U.S. Cl. 260—448.8 R 5 Claims

A new class of organosilicon compounds having an isothiocyanate group bonded to the silicon atom through an alkylene bridge of at least three carbon atoms, or an alkylene bridge having sulfur oxygen or nitrogen linkages therein is made by reacting the corresponding amino alkyl substituted organosilicon compound with carbon disulfide and a dialkyl carbodiimide. The compositions are extremely useful where base cleavage of the silicon atom from the isothiocyanate substituted group is a problem, such as glass sizing where the glass is basic and the formation of polyurethanes where a base catalyst is implied.

3,790,614

HERBICIDAL IMIDO ESTERS

Paulus P. Montijn, Amsterdam, Netherlands, and Ernest Haddock, Sheppey, Kent, England, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Dec. 6, 1971, Ser. No. 205,319
Claims priority, application Great Britain, Sept. 14, 1971, 59,718/71
Int. Cl. C07c 119/20
U.S. Cl. 260—453 R 1 Claim

Ethyl N-benzoyl - 3,4 - dichloroanilinopropionimidate monohydrochloride, useful for controlling undesired plant growth.

3,790,615

O,N-DIPHENYLTHIOCARBAMIC ACID ESTERS

Walter Traber, Riehen, Heinz Hamböck, Binningen, and Anton Georg Weiss, Benken, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Original application Jan. 26, 1970, Ser. No. 5,954, now Patent No. 3,721,699. Divided and this application Jan. 2, 1973, Ser. No. 320,390
Int. Cl. C07c 125/06
U.S. Cl. 260—455 A 5 Claims

Certain O,N-diphenyl-carbamic acid esters in which one phenyl moiety is substituted in the 2-position by a halogenated phenoxy radical are disclosed as microbicidally active compounds. A method for controlling microorganisms with the aid of such compounds and compositions containing them are also described.

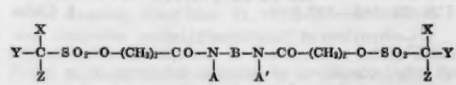
3,790,616

SULPHONIC ACID ESTERS, THEIR PRODUCTION AND COMPOSITIONS OF AND USES THEREFOR

Alexander Senning, Brabrand, and Hans Christian Buchholt, Aayboy, Denmark, and Robert Bierling, Wuppertal-Elberfeld, Dieter Steinhoff, Bochum, and Gerhard Trossmann, Bonn-Bad Godesberg, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

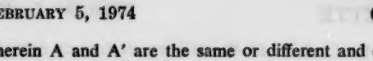
No Drawing. Filed Dec. 3, 1971, Ser. No. 204,684
Claims priority, application Germany, Dec. 9, 1970, P 20 60 551.0
Int. Cl. A61k 27/00; C07c 143/08
U.S. Cl. 260—456 A 17 Claims

Sulphonic acid esters of the formula:



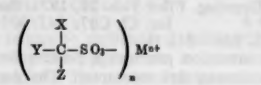
(I)

wherein A and A' are the same or different and each is hydrogen or an aliphatic moiety; B is a bifunctional aliphatic moiety; and X, Y and Z are the same or different and each is hydrogen, halogen, nitrile, pseudo-halogen or methylsulphonyl, are produced by reacting a di-iodo compound of the formula:



(II)

wherein A, A' and B are as above defined, with a sulphonate of the formula:



(III)

wherein X, Y and Z are as above defined; M^{a+} is a cation which forms a sparingly soluble iodide; and n is 1 or 2.

These compounds are useful for their cytostatic activity against transplanted lymphatic leukaemia L 1210 in mice.

3,790,617
PROCESS FOR PREPARATION OF ORGANIC DINITRILES

Yoshiyasu Masada and Teruo Yasue, Kurashiki, Japan, assignors to Kurashiki Rayon Co., Ltd., Kurashiki, Japan

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,812
Claims priority, application Japan, Jan. 25, 1968, 43/4,509
Int. Cl. C07c *121/02, 121/20, 121/26*
U.S. Cl. 260—465.8 D **8 Claims**

A process for preparing organic dinitriles by dimerization of acrylonitrile comprising reacting acrylonitrile with hydrogen in a gaseous phase at 100 to 450° C. under a total pressure of 1 to 20 atmospheres by using as catalyst ruthenium metal or a ruthenium compound reducible to ruthenium metal under reaction conditions. Catalytic activity of the catalyst can be increased by addition of an alkali metal hydroxide or a mixture of a halide of nickel, chromium, molybdenum or tungsten with an organic phosphorus compound.

3,790,618
Nω-4,4-DIMETHOXYBENZHYDRYL DERIVATIVES OF ASPARAGINE AND GLUTAMINE

Wolfgang Konig, Langenhain, Taunus, and Rolf Geiger, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft, vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Original application Mar. 12, 1969, Ser. No. 806,734, now abandoned. Divided and this application Apr. 21, 1971, Ser. No. 136,262
Int. Cl. C07c *103/32*
U.S. Cl. 260—471 A **7 Claims**

Nω-4,4'-dimethoxybenzyl-protected asparagine and glutamine compounds useful as intermediates in the synthesis of therapeutics by peptide condensation reactions.

3,790,619
FLUORIDE SUBSTITUTED CARBANILATES

Fred Y. Edamura and Thomas J. Giacobbe, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Nov. 1, 1971, Ser. No. 194,532
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C **7 Claims**

Compounds useful as herbicides and fungicides defined as substituted (thio-and dithio-)carbanilate compounds and derivatives thereof.

3,790,620
ARYL ESTERS OF PHENYL KETENE CARBOXYLIC ACIDS

Kenneth Butler, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Original application Jan. 5, 1968, Ser. No. 695,851, now Patent No. 3,574,189, dated Apr. 6, 1971. Divided and this application Oct. 31, 1969, Ser. No. 873,087
Int. Cl. C07c *69/66*
U.S. Cl. 260—471 R **8 Claims**

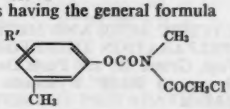
Arylchloro (and bromo) carbonyl ketenes, arylcarboxy ketene esters and aryl carbothiolic phenylesters derived therefrom, methods for their preparation and the use of the esters as acylating agents for the production of esters of α-carboxy and α-carbothiolic arylacetyl derivatives of 6-amino-penicillanic acid and, by hydrolysis, the corresponding acid derivatives are described.

3,790,621
DIALKYLPHENYL-N-METHYL-HALOACETYL CARBAMATES

Michihiko Sakai and Yasuo Sato, Kyoto, and Rokuya Morimoto, Kazuo Konishi, and Katsuyuki Maki, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed May 12, 1969, Ser. No. 823,968
Claims priority, application Japan, May 11, 1968, 43/31,755
Int. Cl. C07c *125/06*
U.S. Cl. 260—479 C **4 Claims**

Compounds having the general formula



wherein R' represents the methyl group attached to the 4- or 5-position of the benzene ring or the isopropyl group attached to the 5-position of the benzene ring, possess good insecticidal properties with low toxicity to homothermal animals.

3,790,622
PROCESS FOR THE PRODUCTION OF HALOGENATED MALONATES

Denzel Allan Nicholson, Springfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Original application Oct. 25, 1968, Ser. No. 770,860, now Patent No. 3,662,039. Divided and this application Dec. 27, 1971, Ser. No. 212,625
Int. Cl. C07c *69/62*
U.S. Cl. 260—485 H **8 Claims**

The process of reacting methylenediphosphonate esters (C_7–C_{22}), malonate esters (C_4–C_{22}), or phosphonoacetate esters (C_8–C_{22}) with hypohalite ions in an aqueous reaction media comprising a water miscible organic solvent; mono- and dihalogenated methylenediphosphonate esters (C_9–C_{22}); mono- and dihalogenated malonate esters (C_4–C_{22}); and mono- and dihalogenated phosphonoacetate esters (C_8–C_{22}).

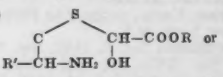
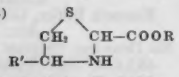
3,790,623
CONDENSATION PRODUCTS OF GLYOXYLIC ACID ESTERS WITH AMINOTHIOLS

Jean-Pierre Fourneau, Paris, France, assignor to Laboratoires Houde, Paris, France

No Drawing. Filed Dec. 16, 1970, Ser. No. 98,921
Claims priority, application France, Dec. 19, 1969, 6944143
Int. Cl. C07c *149/20*
U.S. Cl. 260—481 R **1 Claim**

The invention relates to a therapeutical composition useful in particular for the prevention and treatment of injuries due to ionizing radiations.

Said composition comprises, as active ingredient, a compound responding to either one of the following formulae:

(A)  or (B) 

in which R is a straight- or branched-chain alkyl group having 1–18 carbon atoms and R′ is hydrogen, —COOH or —COOR″ in which R″ is a straight- or branched-chain alkyl group having 1–18 carbon atoms.

The invention relates also to a process for the preparation of the active ingredient of said composition and to the new compounds of Formula A or B.

3,790,624
OXIDATION OF ALKYL-SUBSTITUTED AROMATIC COMPOUNDS

Stephen N. Massie, Palatine, and Herman S. Bloch, Skokie, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Mar. 24, 1972, Ser. No. 237,943
Int. Cl. C07c *45/02, 47/52, 63/02*
U.S. Cl. 260—524 R **11 Claims**

The alkyl-substituted aromatic compounds, and particularly alkyl-substituted aromatic hydrocarbons, are treated with an oxygen-containing gas in the presence of a catalyst comprising a mixture of a transition metal compound and a hypochlorite compound to obtain improved yields of the desired oxygenated aromatic compounds.

3,790,625
POLY(GLYCIDIC ACID) AND METHODS OF PREPARATION THEREFOR

Herwart V. Vogt, Grosse Ile, and Pauls Davis, Gibraltar, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Aug. 24, 1970, Ser. No. 66,618
Int. Cl. C07c *59/12*
U.S. Cl. 260—535 P **3 Claims**

Polymers of glycidic acid are prepared by either (1) oxidation of poly(glycidol) or (2) homopolymerization and ion exchange of potassium glycidate. The polymers of glycidic acid [poly(glycidic acid)] are useful as intermediates in the preparation of alkali soluble resins, thickeners, suspending and dispersing agents, and as flocculants.

3,790,626
PURIFICATION OF ADIPIC ACID

Hiroyuki Shinohara, Hiroaki Ohashi, and Kazuhiko Konno, Oaza-Wakaguri, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan

No Drawing. Filed Mar. 1, 1971, Ser. No. 120,049
Claims priority, application Japan, Apr. 3, 1970, 45/27,904
Int. Cl. C07c *51/42*
U.S. Cl. 260—537 P **6 Claims**

Raw crystals of adipic acid, prepared by oxidizing cyclohexane, cyclohexanone, cyclohexanol, or mixtures thereof with molecular oxygen are purified by subjecting the same to a nitric-acid treatment, the temperature of the raw crystals of adipic acid being prevented from exceeding 75° C. prior to the nitric-acid treatment, and recrystallizing the resulting adipic acid from water.

3,790,627
PROCESS FOR THE PRODUCTION OF TRICHLOROMETHANETHIOSULFENYL CHLORIDE

Helmut Magerlein, Erlenbach, Gerhard Meyer, Obernburg, and Hans-Dieter Rupp, Erlenbach, Germany, assignors to Glanzstoff AG, Wuppertal, Germany

No Drawing. Filed June 29, 1970, Ser. No. 50,919
Claims priority, application West Germany, July 1, 1969, P 19 33 242.4
Int. Cl. C07c *149/16*
U.S. Cl. 260—543 H **9 Claims**

A process for the preparation of trichloromethanethiosulfenyl chloride by reacting sulfur with trichloromethanesulfenyl chloride at an elevated temperature on activated carbon, preferably with less than the stoichiometric amount of sulfur and/or in the presence of sulfur chloride to suppress side reactions. The product of this process is a valuable intermediate known for use especially in the production of pesticides.

3,790,628
PURIFICATION OF PERCHLOROMETHYL MERCAPTAN

Albert M. Leon, Mamaroneck, and Robert C. Whittington, Bronx, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Feb. 22, 1971, Ser. No. 117,685
Int. Cl. C07c *145/00*
U.S. Cl. 260—543 H **5 Claims**

This invention provides a process for the purification of perchloromethyl mercaptan. The purification process comprises thoroughly mixing an impure perchloromethyl mercaptan solution with water for a period between about 1 and about 3 minutes, and separating and removing from the mixture a substantially pure product of perchloromethyl mercaptan.

3,790,629
PROCESS FOR PREPARING ALKYL OR ARYL THIOPHOSPHORUS HALIDES AND MIXED ISOMERS THEREOF

Eugene Henry Uhing, Ridgewood, N.J., and Arthur Dock Fon Toy, Stamford, Conn., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Feb. 18, 1972, Ser. No. 227,616
Int. Cl. C07f *9/42*
U.S. Cl. 260—543 P **9 Claims**

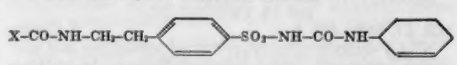
Alkyl or aryl phosphonothioic dihalides and phosphinothioic monohalides are prepared by reacting an aliphatic or aromatic hydrocarbon respectively with a pentavalent thiophosphorus compound having at least two halogens attached thereto, and preferably three halogens, i.e. thiophosphoryl halide under at least autogenous pressure at a temperature of from 200° C. to 450° C. The compounds obtained are useful as constituents in insecticides, fungicides, pharmaceuticals, and as intermediates in preparation of other organophophorus compounds.

3,790,630
BENZENESULFONYL-UREAS

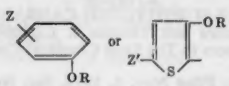
Rudi Weyer, Frankfurt am Main, Walter Aumüller, Kelkheim, Taunus, Helmut Weber, Frankfurt am Main, Karl Muth, Kelkheim, Taunus, and Felix Helmut Schmidt, Mannheim-Neuostheim, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 28, 1969, Ser. No. 845,497
Claims priority, application Germany, Aug. 2, 1968, P 17 93 111.2
Int. Cl. C07c *127/00*
U.S. Cl. 260—553 DA **1 Claim**

Benzenesulfonyl-ureas of the formula



which in the free form or in the form of their salts have blood sugar lowering properties and are distinguished by a strong and long-lasting hypoglycemic action. In the formula X represents



wherein

R stands for an alkyl group having 1 to 4 carbon atoms,
Z stands for a halogen atom, an alkyl or alkoxy group both having 1 to 4 carbon atoms, and

Z' stands for a halogen atom or an alkyl group having 1 to 4 carbon atoms.

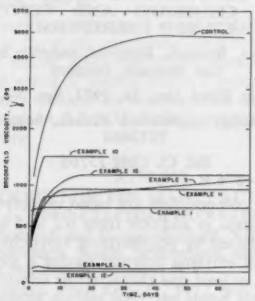
3,790,631
CARBIMIDOYL UREAS
Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
No Drawing. Original application Mar. 2, 1970, Ser. No. 15,905, now Patent No. 3,673,201, which is a division of application Ser. No. 711,192, Mar. 7, 1968, now Patent No. 3,547,937. Divided and this application Oct. 21, 1971, Ser. No. 191,503
Int. Cl. C07c *127/16*
U.S. Cl. 260—553 A **6 Claims**

This invention relates to carbimidoyl ureas which are prepared by reacting the appropriate isocyanates with the appropriate amidines. The compounds possess anthelmintic activity.

3,790,632
BICYCLOHEPTENE-7-SYN-CARBALDEHYDES
Graham Ernest Robinson, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Mar. 28, 1972, Ser. No. 238,968
Claims priority, application Great Britain, Dec. 16, 1971, 58,400/71
Int. Cl. C07c *103/19*
U.S. Cl. 260—557 B **5 Claims**

The disclosure relates to novel bicycloheptene-7-syn-carbaldehydes, and to a novel process for the manufacture of both known and the novel bicycloheptene-7-syn-carbaldehydes, by isomerization of the corresponding anti-carbaldehydes in the presence of an amine.

3,790,633
NOVEL LOW-VISCOSITY EPOXY CURING AGENTS
Woodrow Wilson Jedlicka, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio
Continuation-in-part of abandoned application Ser. No. 76,112, Sept. 28, 1970. This application Mar. 10, 1971, Ser. No. 122,847
Int. Cl. C07c *103/30*
U.S. Cl. 260—561 B **7 Claims**



Novel compositions are prepared by the reaction of a polyamide or polyamine with an N-3-oxohydrocarbon-substituted 3-alkoxy-, 3-mercapto- or 3-aminopropionamide or similar compound. These compositions are useful as curing agents for polyepoxides, especially epoxy resins. Many of them also have low viscosity, low toxicity and low tendency to skin and eye irritation.

3,790,634
PRODUCTION OF AMINES AND DIAMINES
Virgil W. Weiss, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Sept. 2, 1971, Ser. No. 177,490
Int. Cl. C07c *85/04, 85/16*
U.S. Cl. 260—583 N **9 Claims**

Production of amines by:

(1) contacting a halohydrocarbon with a large excess of an ammonium salt and a large excess of ammonia, followed by evaporation of excess ammonia after the formation of amine hydrohalide in the reaction mixture, and
(2) subjecting the said reaction mixture to a temperature below 0° C. with the resultant precipitation of the amine hydrohalide, and
(3) neutralizing the said amine hydrohalide with a base to obtain the free amine.

3,790,635
PROCESS FOR THE PREPARATION OF CANTHAXANTHINE
Jacques Morel, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France
No Drawing. Original application Aug. 23, 1968, Ser. No. 754,996, now Patent No. 3,646,149. Divided and this application June 18, 1971, Ser. No. 154,612
Int. Cl. C07c *45/04, 49/36*
U.S. Cl. 260—586 B **9 Claims**

Canthaxanthine, useful as a coloring agent for foods, may be made by oxidizing β-carotene or retrodehydro-β-carotene with a metaperiodate and, as catalyst, a metal oxide of Group V–A, VI–A, VII–A, or VIII of the Periodic Table.

3,790,636
PROCESS FOR THE PREPARATION OF ALKYL SUBSTITUTED RESORCINOLS
Arnold Brossi, Verona, and Antonino Focella and Sidney Teitel, Clifton, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Original application Jan. 22, 1969, Ser. No. 793,191, now abandoned. Divided and this application Sept. 16, 1971, Ser. No. 181,198
Int. Cl. C07c *49/60*
U.S. Cl. 260—586 R **2 Claims**

Preparation of 5-alkyl substituted resorcinols such as Olivetol from aliphatic aldehydes and intermediates in this process.

3,790,637
PROCESS FOR THE MANUFACTURE OF VANILLIN FROM SULFITE WASTE LIQUOR
Chang-Tsing Yang, Hackensack, N.J., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed May 4, 1972, Ser. No. 250,388
Int. Cl. D21c *11/02*
U.S. Cl. 260—600 **12 Claims**

Vanillin is made by oxygenating sulfite waste liquor at a substantially neutral pH (i.e., between pH 5.5 and 8) in the presence of a water-insoluble solvent for vanillin to effect removal thereof.

3,790,638
(HYDROXY OR ALKANOYLOXY ALKYLENE) DI-HYDROCARBYL PHOSPHINE OXIDES
Hans-Jerg Kleiner, Bad Soden, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengeselschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Aug. 12, 1971, Ser. No. 171,305
Claims priority, application Germany, Aug. 13, 1970, P 20 40 280.6
Int. Cl. C07f *9/50*
U.S. Cl. 260—606.5 P **3 Claims**

Tertiary phosphine oxides are obtained by adding olefins having a terminal hydroxy or amino group or func-

tional derivatives thereof to secondary phosphine oxides. The adducts are useful as intermediates in the preparation of flame-retardant agents, anti-corrosive agents, pesticides, pharmaceuticals and detergents.

3,790,639

PROCESS FOR PRODUCING A WATER-SOLUBLE METHYLOL PHOSPHINE-PHENOL ADDUCT

Donald J. Daigle, New Orleans, and George L. Drake, Jr., and Wilson A. Reeves, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Original application May 7, 1971, Ser. No. 141,356. Divided and this application Mar. 28, 1972, Ser. No. 238,928

Int. Cl. C07f 9/50
U.S. Cl. 260—606.5 P **8 Claims**

Soluble methylol phosphine adducts are prepared by reacting tris(hydroxymethyl)phosphine with substituted or unsubstituted phenol which contains one or more hydrogens ortho or para to the phenolic hydroxyl group. These adducts are convenient and useful for (a) the preparation of flame resistant polymers and (b) the preparation of flame- and glow-resistant organic fibrous materials and flame-, glow-, wrinkle-, and shrink-resistant woven and knit textiles which contain about 25% or more cellulosic fibers.

3,790,640

GLYCOLIC ETHER SUITABLE AS MEDICAMENT

Teikichi Kurosaki, Munehiko Odaka, and Satoshi Hanaoka, Osaka, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

No Drawing. Filed Jan. 3, 1972, Ser. No. 215,181

Claims priority, application Japan, Dec. 31, 1970, 46/124,202

Int. Cl. C07c 43/00, 43/04
U.S. Cl. 260—615 R **1 Claim**

The novel compound, 2-(2-hydroxybutoxy)-3-hydroxybutane, and synthetic methods for producing the same. This compound is useful as a cholagogue and displays a remarkably low toxicity.

3,790,641

METHYLATION OF PHENOLS AT ORTHO-POSITION

Akio Oshima, Hiroshi Oshima, and Takamichi Kombashiri, Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Kitaku, Osaka, Japan

No Drawing. Filed May 11, 1971, Ser. No. 142,344
Claims priority, application Japan, May 16, 1970, 45/41,803, 45/41,804, 45/41,805; June 24, 1970, 45/55,431, 45/55,432; Sept. 11, 1970, 45/80,255, 45/80,256

Int. Cl. C07c 37/16
U.S. Cl. 260—621 R **6 Claims**

Phenol, cresol or the like phenols each having at least one hydrogen atom at ortho-position, is methylated at ortho-position thereof in high selectivity by reacting with methanol using a novel catalyst system selected from at least one of the following Groups (a), (b) and (c):

(a) A combination of at least one of magnesium oxide, zinc oxide and beryllium oxide, at least one of lanthanide oxide, scandium oxide and yttrium oxide, and at least one of uranium oxide and tin oxide;

(b) A combination of at least one of scandium oxide, yttrium oxide and lanthanide oxide, and tin oxide; and

(c) A combination of at least one of uranium oxide and lanthanide oxide, and active carbon.

3,790,642

SELECTIVE DISPROPORTIONATION OF CRESOLS

Naoya Kominami, Tokyo, Nobuhiro Tamura, Oi, and Hiroshi Mikami and Etsuo Yamamoto, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed June 8, 1971, Ser. No. 150,915

Claims priority, application Japan, June 12, 1970, 45/50,261

Int. Cl. C07c 37/00, 37/12
U.S. Cl. 260—621 D **4 Claims**

An improved process for the preparation of phenol and xylenols from cresols by a disproportionation reaction characterized in that the disproportionation reaction is effected with heating in the presence of an alumina catalyst having ammonium thiocyanate incorporated therein or an alumina catalyst having ammonium thiocyanate together with at least one of metals Co, Ni, Pd and Rh incorporated therein. This process can selectively provide as a main product a xylenol having a methyl group at the ortho position, which is useful as a raw material for the production of industrial chemicals.

3,790,643

HEXAHYDRO-o-XYLYLENE COMPOUNDS AND PROCESS FOR THEIR PRODUCTION

Donald J. Anderson, San Anselmo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation of application Ser. No. 621,792, Mar. 9, 1967, which is a continuation-in-part of application Ser. No. 258,632, Feb. 14, 1963, both now abandoned. This application May 19, 1972, Ser. No. 255,035

Int. Cl. C07c 17/28, 23/00
U.S. Cl. 260—648 R **4 Claims**

Hexahydro-o-xylylene compounds are produced under free radical catalysts in a 1 to 1 addition of 1,7-octadiene with carbon compounds having a chain transfer constant (100° C. and 1-octene) in the range 0.05 to 10. The reaction is carried out in the liquid phase at a temperature in the range 0° C. to 200° C.

3,790,644

PLASTIC COMPOSITIONS BASED ON POLY (VINYL CHLORIDE) AND CONTAINERS MANUFACTURED THEREFROM

Marc Obsomer, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

No Drawing. Filed Aug. 26, 1971, Ser. No. 175,321

Claims priority, application France, Sept. 2, 1970, 7032003

Int. Cl. C08f 15/06
U.S. Cl. 260—876 R **6 Claims**

The plastic compositions are based on poly(vinyl chloride) and contain in addition from 0.1 to 5% by weight of a resin obtained by polymerizing vinyl chloride in the presence of an ethylene polymer having a melt index of 0.3 to 40 and at least one characteristic selected from (a) 0.2 to 4 double bonds per 1000 carbon atoms and (b) 5 to 30 methyl groups per 1000 carbon atoms and under a partial pressure of vinyl chloride which is always below the saturated vapor pressure of vinyl chloride at the polymerization temperature, the total amount of ethylene polymer in said resin being $\leq$2.5% by weight with respect to the poly(vinyl chloride) base. The compositions are readily processed into hollow containers which are transparent, substantially colorless, and have excellent resistance to aging and good thermal resistance.

3,790,645

METHOD FOR PRODUCING POLYVINYLIDENE FLUORIDE POLYMETHYLMETHACRYLATE COMPOSITIONS

Naohiro Murayama and Makoto Fukuda, Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 18, 1971, Ser. No. 172,705

Claims priority, application Japan, Aug. 20, 1970, 45/72,929

Int. Cl. C08d *9/08*; C08f *29/22*

U.S. Cl. 260—884 5 Claims

Method for producing uniformly blended polyvinylidene fluoride composition, in which methylmethacrylate and/or other monomers copolymerizable with methylmethacrylate is post-polymerized with polyvinylidene fluoride.

3,790,646

OIL-RESISTANT POLYMER COMPOSITION

Tetsu Ohishi, 6–16–9 Shimomeguro, Tokyo, Japan; Hiroshi Fukushima, 2–32–9 Ikego, Zushi, Japan; and Hideo Fukuda, 2975–20, Seya-cho, Yokohama, Japan

No Drawing. Filed Apr. 24, 1972, Ser. No. 247,010

Claims priority, application Japan, May 1, 1971, 46/28,584; Nov. 5, 1971, 46/88,031

Int. Cl. C08d *5/04*; C08f *29/08*

U.S. Cl. 260—894 6 Claims

An oil-resistant polymer composition comprising (I) 5 to 50% by weight of a copolymer consisting essentially of 20 to 50% by weight of acrylonitrile, 50 to 80% by weight of a diene selected from butadiene and isoprene and 0.1 to 10% by weight of an α,β-ethylenically unsaturated carboxylic acid and having a number average molecular weight of about 500 to 10,000 and (II) 95 to 50% by weight of an acrylonitrile/butadiene copolymer.

3,790,647

OZONE TREATED PHENOLIC POLYMER TACKIFIER FOR ETHYLENE PROPYLENE DIENE RUBBERS

Kornel D. Kiss, Easton, Pa., George S. Mills, Boonton, N.J., and Edwin M. Smolin, Easton, Pa., assignors to GAF Corporation, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 19,072, Mar. 12, 1970. This application Mar. 28, 1972, Ser. No. 238,964

Int. Cl. C08f *37/18*

U.S. Cl. 260—897 R 5 Claims

The reaction products of ozone and a compound selected from the group comprising alkyl substituted phenol-acetylene resins, alkyl substituted phenol-aldheyde type resins and resins of natural origin, a process of preparing same, and a method of use therefore in increasing the building tack in E.P.D.M. (ethyl propylene diene monomer) rubber.

3,790,648

PROCESS FOR THE MANUFACTURE OF BENZYLPHOSPHONATES

Andreas Schmidt and Heimo Brunetti, Reinach, and Kurt Schwarzenbach, Aesch, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Feb. 11, 1972, Ser. No. 225,615

Claims priority, application Switzerland, Feb. 17, 1971, 2,315/71

Int. Cl. C07f *9/38*

U.S. Cl. 260—970 10 Claims

Process for the manufacture of 4-hydroxybenzylphosphonic esters by reacting esters of phosphoric acid with 4-hydroxybenzylamines in the presence of a base. The compounds manufactured according to the invention are used as stabilizers.

3,790,649

PREPARATION OF ESTERS OF PHOSPHORUS ACIDS

Ignatius Schumacher, 1009 S. Elm W. Baker, 421 Greenleaf Drive Louis, Mo. 63119, and Joseph 63122, both of St.

No Drawing. Filed June 24, 1971, Ser. No. 156,487

Int. Cl. C07f *9/08, 9/16*

U.S. Cl. 260—973 17 Claims

Halogen-containing esters of phosphorus acids are prepared by an improved process whereby thiol- or hydroxyl-containing organic materials and phosphorus halides are reacted at specified temperatures in the presence of a distillation residue, produced by distilling (a) the product derived from a reaction mixture of a thiol- or hydroxyl-containing organic material, a phosphorus halide and a catalyst material selected from amide, phosphorus amide, urea and ammonium salt compounds containing a nitrogen atom capable of forming a complex with a phosphorus moiety or (b) the product derived from such reaction mixture in which said distillation residue is employed as the catalyst material, thereby providing high yields of substantially pure esters and allowing preparation of selected halogen-containing mono- and di-esters of phosphorus esters having substantially no side reactant contamination. The phosphorus esters are useful as intermediates in the preparation of plasticizers, oil additives and functional fluids.

3,790,650

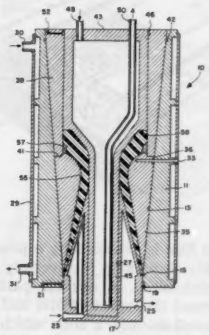
METHOD FOR COMPRESSION MOLDING OF THERMOSETTING PLASTICS UTILIZING A TEMPERATURE GRADIENT ACROSS THE PLASTIC TO CURE THE ARTICLE

Wilbur C. Heier, Hampton, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 15, 1971, Ser. No. 198,763

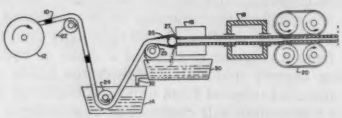
Int. Cl. B29g *1/00*

U.S. Cl. 264—102 9 Claims



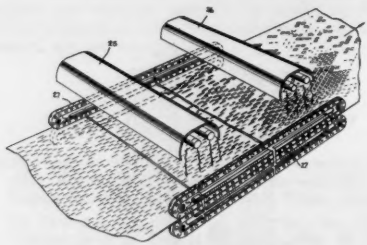
Method for compression molding of thermosetting plastics compositions wherein heat is applied to the compressed load in a mold cavity and adjusted to hold molding temperature at the interface of the cavity surface and the compressed compound to produce a thermal front. This thermal front advances into the evacuated compound at mean right angles to the compression load and toward a thermal fence formed at the opposite surface of the compressed compound.

3,790,651
PROCESS FOR THE MANUFACTURE OF PLASTIC-COATED TUBULAR ARTICLES
Sylvester Martin Meitinger, Toledo, Ohio, assignor to Stauffer Chemical Company, New York, N.Y.
Continuation of abandoned application Ser. No. 862,102, July 7, 1969, which is a division of application Ser. No. 610,095, Jan. 18, 1967, now Patent No. 3,533,133, dated Oct. 13, 1970. This application Aug. 5, 1971, Ser. No. 169,499
Int. Cl. B29d *23/05*
U.S. Cl. 264—135 **4 Claims**



Method of continuously applying a plastic coating to a tubular article, normally one which is not self-supporting. The said tubular article in flattened condition is passed over a ball means which coacts with an extrusion inlet to restore the flattened article into cylindrical configuration for coating of said tubular article. The plastic is formed as an annular stream into which the article is passed.

3,790,652
METHOD FOR PRODUCING A THERMOPLASTIC NET BY SLITTING AND SHRINKING OPERATIONS
Johannes Jacobus Vincent Collijn and Günter Horst Tesch, Fribourg, Switzerland, assignors to Breveteam S.A., Fribourg, Switzerland
Continuation-in-part of abandoned application Ser. No. 28,705, Apr. 5, 1970. This application June 8, 1971, Ser. No. 151,011
Int. Cl. B29c *17/10, 17/14;* **B29d** *7/20*
U.S. Cl. 264—146 **8 Claims**

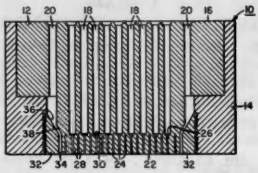


Thermoplastic film is extruded by a practice forming a film that is highly shrinkable transversely relative to any longitudinal shrinkability. A suitable pattern of longitudinal slits is formed through this film and thereafter it is continuously passed through a zone which opens the slits by shrinking the film to form a net which is coiled.

3,790,653
POLYESTER FILM BASE HAVING UNIFORM HIGH OPTICAL DENSITY
Kenneth T. Barkey, Gerald C. Gandy, and Douglas C. May, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Dec. 29, 1971, Ser. No. 213,808
Int. Cl. B29d *7/24;* **C08g** *39/10, 51/08*
U.S. Cl. 264—171 **5 Claims**

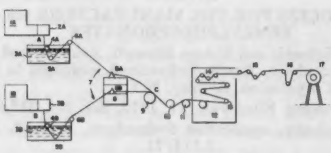
Biaxially-oriented polyester film base having uniform high optical density and free of pinholes or other opacity defects is produced by forming a dispersion of carbon black and polyvinylpyrrolidone (PVP) in ethylene glycol in a high shear mill, adding the dispersion along with polyester forming reactants to an ester exchange reactor, and carrying out the production of the polyester monomer and its subsequent conversion to polyester prepolymer and polyester in the presence of the dispersed carbon and PVP.

3,790,654
EXTRUSION METHOD FOR FORMING THIN-WALLED HONEYCOMB STRUCTURES
Rodney D. Bagley, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Nov. 9, 1971, Ser. No. 196,986
Int. Cl. B29f *3/00*
U.S. Cl. 264—177 **4 Claims**



Method for forming thin-walled honeycomb structures is provided in the use of an extrusion die having an outlet face provided with a gridwork of interconnected discharge slots and an inlet face provided with a plurality of feed openings extending partially through said die in communication with said discharge slots. Extrudable material is fed to said die under pressure wherein the extrudable material flows longitudinally through the feed openings in the inlet face of the die and is directed thereby to the interconnected discharge slots communicating with the outlet face, wherein a portion of the material flows laterally within such slots to form a continuous mass before being discharged longitudinally therefrom to thereby form a thin-walled structure having a multiplicity of open passages extending therethrough. The longitudinally discharged mass is rigidified to prevent deformation of said passages.

3,790,655
METHOD FOR COMMINGLING AND ORIENTING COLORED SETS OF THERMOPLASTIC FILAMENTS
Frank Richard Cramton, Burlington, Vt., assignor to E. B. & A. C. Whiting Company, Burlington, Vt.
Filed Mar. 2, 1971, Ser. No. 120,190
Int. Cl. D01d *5/12*
U.S. Cl. 264—210 F **5 Claims**



Differently colored sets of unoriented thermoplastic filaments are passed along converging paths and then commingled to form a multi-colored filament web. This web is subsequently heated to the orientation temperature of the filaments and then stretched along the longi-

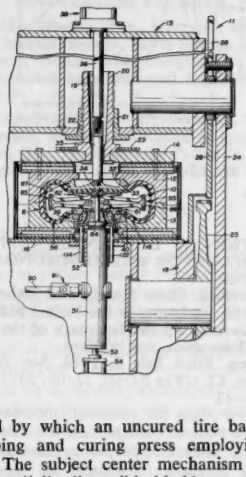
tudinal axis of the web to simultaneously stretch-orient each filament of the multi-colored web.

3,790,656

METHOD FOR LOADING A TIRE SHAPING AND CURING PRESS EMPLOYING A CENTER MECHANISM

Gary R. Getz, Norton, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed Oct. 4, 1971, Ser. No. 185,931
Int. Cl. B29h *5/06*
U.S. Cl. 264—315 **12 Claims**



A method by which an uncured tire band is loaded into a shaping and curing press employing a center mechanism. The subject center mechanism employs the well-known, radially distensible bladder to shape the tire band, but provides bearing plates disposed within the cavity defined by said bladder and movable radially to effect the application of pressure against locations within a predetermined area on the radially inner surface of the uncured tire band—viz., an area intercepted by its transverse plane of structural symmetry—and to support the tire band in spaced relation with respect to the mold sections and/or the bead rings associated therewith while the bladder is inflated progressively and symmetrically within the tire band. This radially outward displacement of the bearing plates assures that the bladder will also be inserted symmetrically within the tire band, and such displacement can be readily effected by a mechanical drive. The center mechanism is used by positioning an uncured tire band in a predetermined position concentrically of the center mechanism, effecting supporting engagement of the tire by the center mechanism, inflating the bladder to at least substantially shape the tire and then closing the mold for the curing cycle.

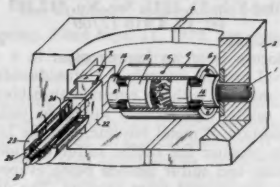
3,790,657

METHOD OF AND DEVICE FOR THE FORMATION OF BEAM STRUCTURES

Constantin Leonte, Iasi, Rumania, assignor to Institutul Politehnic Iasi, Iasi, Rumania

Filed Dec. 15, 1971, Ser. No. 208,293
Int. Cl. E04c *3/10, 5/08*
U.S. Cl. 264—228 **1 Claim**

Beams are assembled at grade level from a multiplicity of precast concrete elements which are cemented together at their joints by mortar and, after the mortar has hardened, tension is applied to a cable extending through a channel of the beam formed by aligned passages of the individual elements. The tension is applied by relatively displacing wedge members of a removable assembly at an emergent end of the cable and the beams can then be erected. Externally threaded rings on the emergent ends of the cables of a pair of spacedly aligned beams are threaded into a pipe after a mortar between the beams has hardened,



thereupon transmitting tensile force between the cables. The wedge assembly is then removed and the space around the cables and the pipe, and the space occupied by the wedge assembly, is filled with concrete.

3,790,658

PURIFICATION PROCESS FOR RECOVERING URANIUM FROM AN ACIDIC AQUEOUS SOLUTION BY pH CONTROL

Joseph S. Fox, Lewiston, N.Y., and Jerome D. Koetting, Parkersburg, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed May 15, 1970, Ser. No. 37,870
Int. Cl. C01g *43/00*
U.S. Cl. 423—15 **10 Claims**

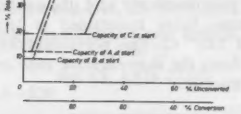
A process for obtaining purified uranium values from an acidic aqueous solution contaminated with iron, vanadium, phosphorus and sodium values by selectively precipitating the contaminants through acidity (pH) control of the solution.

3,790,659

ACTIVATED CARBON CATALYST IMPREGNATED WITH SiO_2

Klaus Storp, Frankfurt am Main, and Reinhard Höhne, Neu Isenburg, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 20, 1971, Ser. No. 135,633
Int. Cl. B01d *53/16, 53/34*
U.S. Cl. 423—224 **2 Claims**


A: Activated carbon + 8.0 % SiO2
B: Activated carbon + 13.9 % SiO2
C: Activated carbon - nonimpregnated
% Total sulfur capacity
Capacity of C at start
Capacity of A at start
Capacity of B at start
% Unconverted
% Conversion

Activated carbon catalyst, impregnated with silicate, for promoting the sulfur-forming reactions:

$$2H_2S+SO_2 \rightarrow 3S+2H_2O$$

$$H_2S+\tfrac{1}{2}O_2 \rightarrow S+H_2O$$

The SiO_2 concentration is 0.5 to 8.0% by weight, preferably 3.0 to 7.5% by weight, the internal surface is 1200 to 1500 $m.^2/g.$, the bulk density is at most 350 g./liter and the modal pore radius is 4 to 12 A.

3,790,660

PROCESS FOR RECOVERING SULFUR DIOXIDE FROM GASES

Christopher B. Earl and Fred Hughes, Lakeland, Fla., assignors to Wellman-Lord, Inc., Lakeland, Fla.

Filed Feb. 22, 1971, Ser. No. 117,383
Int. Cl. C01b *17/00*
U.S. Cl. 423—242 21 Claims

The disclosure is of an improvement in a sulfur dioxide removal process wherein a sulfur dioxide-containing gas is contacted with an aqueous absorbing solution of a metal sulfite, e.g., sodium sulfite, to yield a spent absorbing solution of metal bisulfite, and the latter is decomposed to produce the sulfite, sulfur dioxide and water, with water and sulfur dioxide being evaporated and sulfite being precipitated from solution. The decomposition is conducted while adding heat to the material undergoing decomposition by the use of indirect heat exchange between the material which is passed through the tubes of the heat exchanger, and a heat-supplying medium in contact with the exterior surfaces of the tubes. The operation is particularly characterized by the presence of at least about 25 weight percent undissolved solids in the material undergoing decomposition, preferably about 30 to 50 weight percent. A portion of the material undergoing decomposition and containing sulfite can be recycled to the absorption step to serve as a source of aqueous absorbing solution. Preferably, this recycle stream is formed by adding water to a portion of the material undergoing decomposition without separation of significant amounts of undissolved solids.

3,790,661

PROCESS FOR THE CONTINUOUS DEARSENIFICATION OF POLYPHOSPHORIC ACID

Horst Dieter Wasel-Nielen, Erftstadt-Lechenich, and Gero Heymer, Erftstadt-Liblar, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

Filed Mar. 1, 1972, Ser. No. 230,930
Claims priority, application Germany, Mar. 3, 1971, P 21 09 970.7
Int. Cl. C01b *25/16*
U.S. Cl. 423—321 8 Claims

Polyphosphoric acid is dearsenicated continuously. To this end, polyphosphoric acid contaminated with arsenic is continuously introduced overhead into a packed gasification zone and hydrogen sulfide, travelling countercurrently with respect to the said polyphosphoric acid, is introduced thereinto from below and circulated therein. The polyphosphoric acid is allowed to remain in the gasification zone for a mean period between 1 and 5 hours so as to effect complete transformation of the arsenic into arsenic sulfide. Following this, the polyphosphoric acid is delivered to a degasification zone communicating with the gasification zone and compressed air is injected into the degasification zone so as to expel hydrogen sulfide in excess from the polyphosphoric acid, the gasification and degasification zones being maintained at temperatures between 80 and 140° C. The polyphosphoric acid so treated is taken from the degasification zone and filtered in conventional manner.

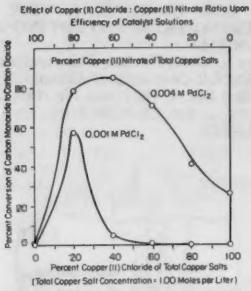
3,790,662

PALLADIUM COMPOSITIONS SUITABLE AS OXIDATION CATALYSTS

William G. Lloyd and Donald R. Rowe, Bowling Green, Ky., assignors to Larox Research Corporation, Bowling Green, Ky.

Filed Feb. 7, 1972, Ser. No. 223,970
Int. Cl. C01b *31/20, 17/68*
U.S. Cl. 423—437 15 Claims

Homogeneous and heterogeneous catalysts systems containing certain palladium (II) salts and copper (II) salts have been developed. A specified balance of a copper (II) halide and of a non-halide copper (II) salt is maintained.


Effect of Copper (II) Chloride : Copper (II) Nitrate Ratio Upon
Efficiency of Catalyst Solutions
Percent Copper (II) Nitrate of Total Copper Salts
0.004 M $PdCl_2$
0.001 M $PdCl_2$
Percent Conversion of Carbon Monoxide to Carbon Dioxide
Percent Copper (II) Chloride of Total Copper Salts
(Total Copper Salt Concentration = 1.00 Moles per Liter)

The catalysts are effective for oxidizing CO to CO_2 and SO_2 and SO_3.

3,790,663

PREPARATION OF DRY ANTISERUM COATED SOLID-PHASE FOR RADIOIMMUNOASSAY OF ANTIGENS

Mary M. Garrison, Silver Spring, and Robert W. Bates, Bethesda, Md., assignors to the United States of America as represented by the Secretary of the Department of Health, Education, and Welfare

No Drawing. Filed July 7, 1970, Ser. No. 52,990
Int. Cl. G01n *31/00, 31/06, 33/16*
U.S. Cl. 424—12 10 Claims

A dried solid phase for radioimmunoassay of antigens which is stable without refrigeration for extended periods of time, and a method of preparing the solid phase. The solid-phase is prepared by coating an organic polymer with antiserum and then air drying same at about 25° C.

3,790,664

FILM-FORMING ORGANIC POLYMER-MODIFIED STARCH MATERIAL HAIR SETTING COMPOSITION

David Arthur Krochock, Mundelein, and Donald David Laiderman, Deerfield, Ill., assignors to The Gillette Company, Boston, Mass.

No Drawing. Filed Oct. 16, 1970, Ser. No. 81,557
Int. Cl. A61k *7/10*
U.S. Cl. 424—47 7 Claims

Composition for setting hair and simultaneously repressing or retarding development of an oily appearance containing a solution of a resin in a volatile solvent and dispersed in the solution a starch acid ester reacted with a polyvalent metal ion. A pressure propellant may be included.

3,790,665

INJECTABLE ADJUVANT, METHOD OF PREPARING SAME AND COMPOSITIONS INCLUDING SUCH ADJUVANT

Max E. Glass and Stephen F. Donahue, Kansas City, Mo., and Arthur Carlson, Jr., Overland Park, Kans., assignors to Haver-Lockhart Laboratories, Inc., Shawnee, Mo.

No Drawing. Continuation-in-part of application Ser. No. 707,671, Feb. 23, 1968, now Patent No. 3,639,577, dated Feb. 1, 1972. This application Jan. 31, 1972, Ser. No. 222,282
Int. Cl. A61k *23/00, 27/00*
U.S. Cl. 424—81 40 Claims

A medicinal composition comprising an injectable active substance or agent combined with a novel adjuvant therefor capable of enhancing the effect of the agent. The adjuvant in its preferred form includes a macromolecular synthetic resin complexing material such as an

acrylic acid polymer cross-linked with a polyallyl saccharide, and an emulsion system therefor including a surfactant selected from the group consisting of nonionic and amphoteric nontoxic surfactants, and a water in oil or oil in water emulsion carrier. The adjuvant is useful with various medicinal agents including antigens, hormones or drug and serums of the type which will complex with the synthetic resin material.

3,790,666

CIS-3-HEXENYL BUTYRATE AS AN ATTRACTANT FOR YELLOW JACKETS

Gaines W. Eddy, Mission, Tex., Harry G. Davis, Fresno, Calif., and Morton Beroza, Silver Spring, and Terrence P. McGovern, Bowie, Md., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Application June 27, 1969, Ser. No. 857,611, now abandoned, which is a division of application Ser. No. 623,154, Dec. 29, 1966, now Patent No. 3,485,868. Divided and this application Apr. 11, 1972, Ser. No. 243,049

Int. Cl. A01n *17/14*

U.S. Cl. 424—84 **1 Claim**

The insect attractants of the present invention are highly specific for yellow jackets (Vespula spp.), attracting few other insects and no beneficial species such as honey bees. These attractants are organic esters having a total of from 9 to 12 carbon atoms, and they have at least one center of unsaturation, as exemplified by cis-3-hexenyl butyrate and 2-methylpentyl crotanate, or an alicyclic radical as in 4-methylcyclohexyl butyrate. The ester, 2,4-hexadienyl butyrate, was outstanding in field tests. Incorporated into compositions containing an insecticide, chemosterilant or other control agent, the attractants provide an improved means of reducing or eliminating populations of yellow jackets.

3,790,667

RUMINANT FEED UTILIZATION IMPROVEMENT

Arthur P. Raun, New Palestine, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 15, 1972, Ser. No. 315,730

Int. Cl. A61k *21/00*

U.S. Cl. 424—115 **7 Claims**

Ruminant animals having a developed rumen function and animals which ferment fibrous vegetable matter in the cecum convert their feed more efficiently to energy when orally treated with antibiotic A-201A.

3,790,668

RUMINANT FEED UTILIZATION IMPROVEMENT

Arthur P. Raun, New Palestine, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Dec. 15, 1972, Ser. No. 315,729

Int. Cl. A01k *21/00*

U.S. Cl. 424—117 **7 Claims**

Antibiotics thiostrepton and siomycin and the physiologically-acceptable salts and complexes of thiostrepton improve the digestive efficiency of certain animals. Oral administration of the antibiotics to ruminant animals having a developed rumen function, and to animals which ferment fibrous vegetable matter in the cecum, changes the digestive fermentation of the animals to produce more propionates relative to the production of acetates.

3,790,669

SYNERGISTIC TYLOSIN AND FURAZOLIDONE MEDICATION FOR CALF PNEUMOENTERITIS COMPLEX

Charles Gale, Indianapolis, Ind, assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Sept. 11, 1972, Ser. No. 288,226

Int. Cl. A61k *21/00*

U.S. Cl. 424—120 **10 Claims**

Administration of a synergistic combination of tylosin and furazolidone prevents and treats pneumoenteritis complex disease of calves. Oral administration is particularly preferred. Novel feed compositions containing my combination are effective in my method of controlling pneumoenteritis complex disease.

3,790,670

OXIMINOPHOSPHONODITHIOATES AS INSECTICIDES AND ACARICIDES

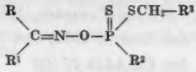
Arnold D Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Original application Apr. 6, 1970, Ser. No. 26,148, now Patent No. 3,666,839. Divided and this application Mar. 9, 1972, Ser. No. 233,332

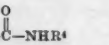
Int. Cl. A01n *91/36*

U.S. Cl. 424—210 **20 Claims**

Compounds having the formula



in which R is (1) alkyl or (2) lower alkylthiomethyl; R^1 is alkyl; R^2 is alkyl; and R^3 is (1) hydrogen, (2) lower alkylthio, (3) cyano, (4) phenylthio, (5) substituted phenylthio wherein the substituent is halogen, (6)



wherein R^4 is hydrogen or alkyl, (7) halophenyl, (8) phthalimido, (9) vinyl, (10) carboalkoxy, (11) alkyl, (12) ethynyl, (13) $CCl_2=CR^5$— wherein R^5 is hydrogen or chlorine, (14) $—CH_2OC(O)NH$(lower alkyl) or (15) benzylthio, their use as insecticides and acaricides, process for preparing the compounds, intermediates and a process for preparing intermediates.

3,790,671

FIBRINOLYTIC ACTIVATORS

Alexander Kennedy Sim, 21 Wellside Place, Falkirk, Scotland

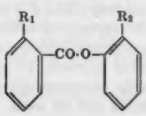
No Drawing. Filed Dec. 23, 1971, Ser. No. 211,686

Claims priority, application Great Britain, Apr. 13, 1971, 9,195/71

Int. Cl. A61k *27/00*

U.S. Cl. 424—230 **4 Claims**

This invention relates to the treatment of thrombosis and prethrombosis conditions by promoting solution of intravascular blood clots. The treatment provided by the invention comprises the administration, orally, parenterally or topically of a compound of the formula



in which R_1 is a substituent selected from the group consisting of an alkyl ester radical and an hydroxyl group and R_2 is a carboxyl radical.

3,790,672

METHOD FOR ACTIVATING BLOOD FIBRINOLYSIS BY ADMINISTRATION OF A SALT OF 2-AMINO-ETHANESULPHONIC ACID

Alberto Giotti, 15 Via Trento, and Federigo Sicuteri, 36 Pizza, d'Azeglio, both of Firenze, Italy

Continuation-in-part of application Ser. No. 28,588, Apr. 15, 1970, now Patent No. 3,725,553. This application Mar. 21, 1973, Ser. No. 343,475

Claims priority, application Italy, Feb. 23, 1970, 48,769/70

Int. Cl. A61k *27/00*

U.S. Cl. 424—248 **5 Claims**

A method for activating the fibrinolysis of blood by administration of a composition containing an organic salt of 2-amino-ethanesulphonic acid and a pharmaceutical carrier therefore. The salts are those of pharmaceutically acceptable organic bases such as diethylamine and morpholine.

3,790,673

METHOD OF VIRUS SUPPRESSION BY HYDANTOINS

Koert Gerzon and Charles W. Ryan, Indianapolis, Ind., and Donald C. De Long, Canberra, ACT, Australia, assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed June 1, 1972, Ser. No. 258,617

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 **7 Claims**

5-(3',4'-dichlorophenyl)-5-methylhydantoin and homologs thereof useful in suppressing viral growth both in vivo and in vitro.

3,790,674

1-(2-PYRIDYL) PIPERAZINE AND LEVODOPA COMPOSITION

Rodolfo Rodriguez, Mexico City, Mexico, assignor to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Dec. 21, 1972, Ser. No. 317,113

Int. Cl. A61k *27/00*

U.S. Cl. 424—250 **17 Claims**

A composition comprising 1-(2-pyridyl)piperazine and levodopa in a respective weight ratio of from 1:320 to 1:20 controls tremor symptomatic of parkinsonism in mammals. Pharmaceutically acceptable acid addition salts of 1-(2-pyridyl)piperazine can be substituted in lieu of the parent compound in the composition.

3,790,675

CERTAIN INDOLOBENZAZEPINE DERIVATIVES AS ANALGESICS

Harold Blumberg, Flushing, N.Y., assignor to Endo Laboratories, Inc., Garden City, N.Y.

No Drawing. Filed Apr. 19, 1972, Ser. No. 245,300

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 **13 Claims**

1,2,3,4,8,9 - hexahydropyrido[4',3':2,3]indolo[1,7-ab][1]benzazepine and certain 3-substituted derivatives thereof are useful analgesics, which can be administered orally to warm-blooded animals. In addition to the free bases, their salts with pharmaceutically acceptable organic or inorganic acids can be used.

3,790,676

PREVENTING PAIN, FEVER AND INFLAMMATION WITH CYCLIC HYDROXY SULFOXIDES

Lewis H Sarett, Princeton, Tsung-Ying Shen, Westfield, and Conrad P. Dorn, Jr., Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Application May 22, 1969, Ser. No. 827,044, which is a continuation-in-part of application Ser. No. 476,676, Aug. 2, 1965, both now abandoned. Divided and this application Sept. 20, 1971, Ser. No. 182,131

Int. Cl. A61k *27/00*

U.S. Cl. 424—275 **3 Claims**

Pharmaceutical compositions having as an active ingredient hydroxy sulfoxides. These compositions ar useful as anti-inflammatory compounds, cryoprotectants and skin penetrants. Also included are method of treatment claims.

3,790,677

CONTROL OF PHYTOPATHOGENIC FUNGI WITH 3-ARYLIMINO-1,2-DITHIOLS

Jorg Bader, Arlesheim, and Karl Gatzi, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Original application May 28, 1969, Ser. No. 828,766, now Patent No. 3,676,459. Divided and this application May 1, 1972, Ser. No. 249,426

Claims priority, application Sweden, June 10, 1968, 8,595/68

Int. Cl. A01n *9/12*

U.S. Cl. 424—277 **4 Claims**

3-arylimino-4-chloro-5-thio-1,2-dithiols are disclosed as antifungal agents, which are particularly useful for the protection of plants against phytopathogenic fungi. Antifungal compositions containing them as active ingredients are also described.

3,790,678

MICROBIOCIDAL NITROGEN DERIVATIVES OF HALOGENATED BIPHENYLS

John J. Merianos, Jersey City, Edward Griffin Shay, Belle Mead, Phillip Adams, Murray Hill, and Alfonso N. Petrocci, Glen Rock, N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

No Drawing. Original application Dec. 9, 1969, Ser. No. 883,636, now Patent No. 3,663,620. Divided and this application Feb. 1, 1971, Ser. No. 111,681

Int. Cl. A01n *9/20*

U.S. Cl. 424—330 **1 Claim**

A method of inhibiting microorganisms which comprises applying to the environment in which such microorganisms are found ammonia and aminosubstituted halogenated biphenyls, as well as the nitrogen derivatives thereof such as quaternary ammonium compounds, amine oxides, imidazolines, amides, enamines, ampholytes, and the like.

The ammonia and amino halobiphenyls are prepared by reacting the ammonia or the amine and the halobiphenyl reactants in such a manner that the ratio of amine to halobiphenyl is preferably limited to between two and five mols of amine to each mol of halobiphenyl.

3,790,679

URINARY ANTISEPTIC METHOD WITH THIOACETAMIDINES

Philip J. Shea, Zionsville, Ind., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 30, 1972, Ser. No. 257,941

Int. Cl. A61k *27/00*

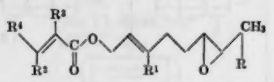
U.S. Cl. 424—326 **8 Claims**

This invention relates to a method useful for combating microorganisms associated with infections of the urinary tract in mammals by means of administering to mammals an amount of a substituted acetamidine compound such as 2-(4-chlorophenyl)thioacetamidine, its corresponding

oxime or a pharmacologically-acceptable salt thereof sufficient to provide an antiseptic amount of said compound in the urinary trace or in the urine.

3,790,680
CERTAIN EPOXIDIZED GERANYL ESTERS AND THEIR USE IN CONTROLLING INSECTS
Hwalin Lee, Palo Alto, Calif., assignor to Stauffer Chemical Company, New York, N.Y.
No Drawing. Original application May 19, 1969, Ser. No. 825,995, now Patent No. 3,584,015. Divided and this application Dec. 28, 1970, Ser. No. 102,157
Int. Cl. A01n *9/28*
U.S. Cl. 424—278 **11 Claims**

Compounds having the formula



in which R and R^1 are independently methyl or ethyl; R^2, R^3, or R^4 are hydrogen or lower alkyl, and the use of these compounds in controlling insects.

3,790,681
METHODS OF TREATING CHOLESTEROLEMIA
Gerard C. Bulteau, Paris, France, assignor to Société d'Etudes Scientifiques et Industrielles de L'Ile-de-France, Paris, France
No Drawing. Continuation-in-part of abandoned application Ser. No. 124,957, Mar. 16, 1971, which is a continuation-in-part of application Ser. No. 760,973, Sept. 19, 1968, now Patent No. 3,632,629. This application July 11, 1972, Ser. No. 270,626
Claims priority, application France, Sept. 26, 1967, 122,380; Nov. 22, 1967, 133,439
Int. Cl. A61k *27/00*
U.S. Cl. 424—311 **6 Claims**

The methods of this invention are useful for the treatment of cholesterolemia in mammals. The methods involve administering to mammals certain fluorinated derivatives of esters of phenoxy isobutyric acid.

3,790,682
ATARACTIC USE OF DIMETHYL SULFOXIDE
Robert J. Herschler, Rte. 2, Box 1592, Camas, Wash., and Stanley W. Jacob, Oswego, Oreg.; said Jacob assignor to Crown Zellerbach Corporation, San Francisco, Calif.
No Drawing. Continuation-in-part of application Ser. No. 686,295, Nov. 28, 1967, now Patent No. 3,549,770, dated Dec. 22, 1970, which is a continuation-in-part of applications Ser. Nos. 329,205, 329,208, 329,209, 329,-238 and 329,271, all Dec. 9, 1963, Ser. No. 346,366, Feb. 10, 1964, and Ser. Nos. 417,781, 417,788 and 417,797, all Dec. 11, 1964, all now abandoned. This application Nov. 30, 1970, Ser. No. 93,841
Int. Cl. A61k *27/00*
U.S. Cl. 424—337 **3 Claims**

Effective amounts of dimethyl sulfoxide (DMSO), as an essential active agent or ingredient, are administered to animals topically, by injection, by installation into body orifices and orally for the relief of signs and symptoms of anxiety.

3,790,683
UNSATURATED SULFUR-CONTAINING NEMATOCIDES AND FUNGICIDES
Paul C. Aichenegg, Prairie Village, Kans., and Carl D. Emerson, Kansas City, Mo., assignors to Baychem Corporation, New York, N.Y.
No Drawing. Original application Jan. 27, 1964, Ser. No. 340,504, now Patent No. 3,592,896. Divided and this application May 13, 1969, Ser. No. 824,275
Int. Cl. A01n *9/00*
U.S. Cl. 424—337 **8 Claims**

Nematodes and fungi are killed with a bis(dichlorovinyl) sulfide, a bis(trichloroethyl) sulfide or a bis(1,2,2-trichlorovinyl) sulfoxide.

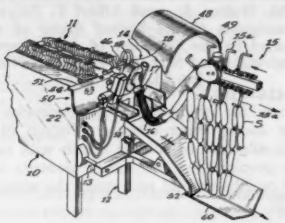
ERRATUM

For Class 424—327 see:
Patent No. 3,790,687

3,790,684
PACKAGES WITH IMPROVED PROPERTIES
Quirino A. Trementozzi, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Continuation-in-part of abandoned application Ser. No. 814,184, Apr. 7, 1969, which is a continuation-in-part of application Ser. No. 642,207, May 29, 1967, now Patent No. 3,451,538. This application Jan. 25, 1971, Ser. No. 109,710
Int. Cl. B65b *3/00;* **B32b** *27/30;* **B65d** *23/00*
U.S. Cl. 426—106 **11 Claims**

Packages of foodstuffs, medicines or related substances enveloped in a molded container formed in an essentially solvent-free condition from a copolymer of acrylonitrile and 10 to 42 percent of a vinyl ester and/or vinyl ether. The resin exhibits oxygen permeability of less than 6:5 cc./100 sq. in. 24 hrs. atmos. mii at 73° F. and water vapor transmitted of less than 8.5 gms./24 hr. 100 sq. in. mil at 100° F. and 95% R.H. so as to protect the contents of the container from degradation.

3,790,685
METHOD OF APPLYING LIQUID SURFACE TREATING MATERIALS TO SAUSAGES
William H. Criss, Hinsdale, and John R. Shackelford, Roselle, Ill., assignors to Stange Co.
Original application Nov. 30, 1970, Ser. No. 93,609. Divided and this application Feb. 22, 1972, Ser. No. 228,104
Int. Cl. A22c *18/00*
U.S. Cl. 426—302 **2 Claims**



A method of applying liquid surface treating materials to a linked string of sausages in a continuous cellulose casing immediately after stuffing and linking and before any other processing occurs. As the linked string of sausages moves in a predetermined path it is subjected to a spray consisting of a liquid surface treating material, the liquid being delivered under pressure to a spray head from a supply tank by a pump in susbtantial excess of the quantity required for surface treatment, and the excess liquid being returned to the tank.

3,790,686
BITTER SUBSTANCES AND THEIR PREPARATION
David Stanley John Gardner, Reigate, and John Anthony Morrell, Horley, England, assignors to White Tomkins Limited, Reigate, Surrey, England
Filed May 17, 1972, Ser. No. 254,028
Claims priority, application Great Britain, May 18, 1971, 15,660/71
Int. Cl. C12c *9/02*
U.S. Cl. 426—349 **6 Claims**

A solution of β-acids extracted from hops was prepared

in methanol, a polar organic solvent. The solution was made alkaline and stirred with sodium hypochlorite. The product was extracted with ether after acidification and found to be bitter substance. The potassium salt of the substance was water solution. The substance and its salt can be added to beer to enhance its bitterness.

3,790,687

METHODS OF COMBATTING FUNGI AND BACTERIA USING SUBSTITUTED-ALPHA-ISONITROSO-ACETOPHENONES

Daniel Bertin, Jacques Perronnet, and Andre Teche, Paris, France, assignors to Roussel-UCLAF, Paris, France

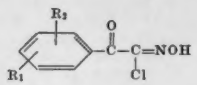
No Drawing. Continuation-in-part of abandoned application Ser. No. 112,401, Feb. 3, 1971. This application May 22, 1972, Ser. No. 255,598

Claims priority, application France, Feb. 24, 1970, 6,527; May 26, 1971, 19,048

Int. Cl. A01n *9/20, 9/24*

U.S. Cl. 424—327 **11 Claims**

Biocidal compositions having as the active ingredient an acetophenone of the Formula I



I

wherein R_1 represents hydrogen, chloro or hydroxy and R_2 represents hydrogen, hydroxy, nitro, methoxy, chloro or acetoxy, and a method of killing or combatting bacteria and fungi.

3,790,688

WATER DISPERSIBLE BETA-CAROTENE

William M. Walter, Jr., and Albert E. Purcell, Raleigh, N.C., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Mar. 15, 1972, Ser. No. 235,078

Int. Cl. A23l *1/26*

U.S. Cl. 426—380 **1 Claim**

A process for preparing water dispersible β-carotene by slowly adding ether ethanol solutions of β-carotene to boiling solutions of soluble starch with rapid stirring and then precipitating the starch carotene colloid with methanol or ethanol and recovering the water dispersible precipitate.

3,790,689

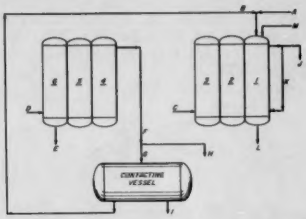
EXTRACTION OF ROASTED AND GROUND COFFEE

Esra Pitchon, Flushing, and Ernest L. Earle, Jr., New City, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 24, 1972, Ser. No. 246,955

Int. Cl. A23f *1/08*

U.S. Cl. 426—434 **28 Claims**



In a process for split-extraction percolation of roasted and ground coffee it has been discovered that by rapidly draining, or blowing out the extraction liquor from the fresh stage extraction column, a coffee extract of improved quality is obtained. Also, it has been discovered that if the secondary extract from the autoclave section is contacted with fresh-roasted and ground coffee, the quality of the secondary extract is upgraded. The preceding steps in combination is a preferred method of practicing split-extraction percolation.

3,790,690

PROCESS FOR THE PRODUCTION OF CORTICATED OAT KERNELS AND OAT FLAKES

Hans-Joachim F. G. Fritze, Riedener Weg. 44A, Starnberg, Germany

No Drawing. Filed Dec. 27, 1971, Ser. No. 212,768

Int. Cl. A23l *1/10*

U.S. Cl. 426—457 **11 Claims**

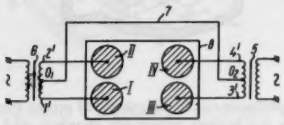
Oat kernels and oat flakes are produced by cleaning the oats and then wetting with water and storing in a wood silo for 24–72 hours until the moisture content is brought to 17–21% practically evenly distributed throughout the entire kernels and the kernels begin to germinate. Thereafter the oats are hulled, cleaned and kiln-dried at a temperature of not more than 65° C. to a desired moisture content.

ELECTRICAL

3,790,691
METHOD FOR ELECTROSLAG REMELTING OF CONSUMABLE ELECTRODES

Boris Evgenievich Paton; Vladimir Konstantinovich Lebedev; Boris Izrailevich Medovar; Igor Vladimirovich Pentegov; Jury Vadimovich Latash; Oleg Petrovich Bondarenko; Vitaly Mikhailovich Baglai; Nikolai Vasilievich Podola, and July Georgievich Emelyanenko, all of Kiev, U.S.S.R., assignors to Institut Elektrosvarki Im. E.O. Patona, Kiev, U.S.S.R.

Division of Ser. No. 26,733, April 8, 1970, Pat. No. 3,665,081.
This application Apr. 13, 1972, Ser. No. 243,885
Claims priority, application U.S.S.R., June 16, 1969, 1336305
Int. Cl. H05b *3/60*
U.S. Cl. 13—9 **13 Claims**



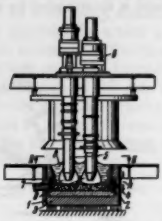
The invention relates to the field of electrometallurgy, and in particular to a method for electroslag remelting. The method is characterized in that it utilizes a transformer power supply means, which can be three-phase or which can consist of several single-phase transformers. The method uses secondary windings of the transformer power supply and incorporates center tappings of those secondaries interconnected to provide for an equality of the line speeds of melting the electrodes and for a uniform temperature field within the slag bath. The method can be utilized in the process of producing unique hollow or solid ingots and slabs of high-grade steels and alloys having a weight of 200 tons and higher.

3,790,692
THREE-PHASE ELECTRIC FURNACE FOR MANUFACTURING ALUMINIUM-SILICON ALLOYS

Jury Ivanovich Brusakov, Novo-Izmailovsky prospect, 37, kv. 42, Leningrad; Nikolai Nikolaevich Sirotkin, ulitsa Bela Kuna, 5, kv. 228, Leningrad; Vasily Pavlovich Kiselev, ulitsa Lensoveta, 48, kv. 10, Leningrad; Dmitry Vladimirovich Ilinkov, ulitsa Tregubenko, 13, kv. 5, Zaporozhie; Mikhail Pavlovich Avdeev, Irkitskoi oblasti 7, kvartal, 30, kv. 7, Shelekhev; Semen Panteleevich Marin, ulitsa 40 let Sovetskoi Ukrainy, 86, kv. 53, Zaporozhie; Alexandr Ivanovich Shkarupa, ulitsa Patrioticheskaya, 74, kv. 45, Zaporozhie; Boris Ottovich Veisman, ulitsa 40 let Sovetskoi Ukrainy, 40a, kv. 27, Zaporozhie; Vladimir Nikolaevich Lebedev, prospekt Lenina, 159, kv. 33, Zaporozhie, and Nikolai Pavlovich Gavrilenko, Pravy bereg, ulitsa Dudykina, 7, kv. 8, Zaporozhie, all of U.S.S.R.

Continuation of Ser. No. 174,381, Aug. 24, 1971, abandoned.
This application Sept. 8, 1972, Ser. No. 287,567
Claims priority, application U.S.S.R., Nov. 11, 1970, 1485652
Int. Cl. F27b *14/14;* **H05b** *7/00*
U.S. Cl. 13—9 **2 Claims**

In an electric furnace relationship between the bath diameter "d," the lining height "h" and the distance between the electrode axes "1" is such as to form a common reaction zone

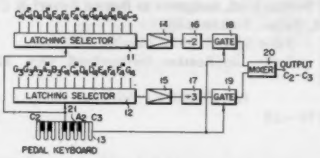


for reducing metal oxides of the charge and to provide for free discharge of the metal being produced.

3,790,693
TONE KEYING AND SYNTHESIZING SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENT

Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Dec. 6, 1972, Ser. No. 312,680
Claims priority, application Japan, Dec. 29, 1971, 47-2142; Feb. 10, 1972, 47-14687; Feb. 10, 1972, 47-14688
Int. Cl. G10h *1/02, 5/06*
U.S. Cl. 84—1.01 **23 Claims**



First and second latching selectors receive tone signals from the tone generators and are operatively coupled to a keyboard for respectively deriving first and second tone signals having frequencies determined by the depressed keys in the keyboard. The frequencies of the first and the second tone signals are respectively divided by first and second frequency dividers respectively having predetermined dividing factors of, for example, 2 and 3, so that the first and the second frequency divided tone signals (i.e., the signals at the outputs of the frequency dividers) have a frequency ratio which is close to but not exactly equal to an integer. The mixed resultant tone exhibits an ensemble effect as produced by a multi-series tone generator.

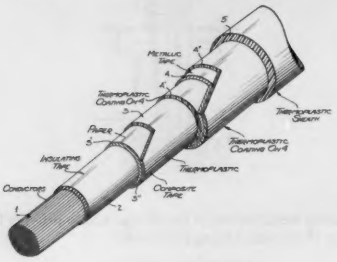
3,790,694
FILLED TELEPHONE CABLE WITH BONDED SCREENING LAYER

Antonio Portinari, Sesto San Giovanni, Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed May 23, 1973, Ser. No. 363,060
Claims priority, application Italy, June 7, 1972, 25330 A/72
Int. Cl. H01b *7/18, 3/18*
U.S. Cl. 174—23 R **10 Claims**

A fully-filled telephone cable having a central core of insulated wires bunched together and held together by a layer of

an insulating tape, both the spaces between the wires and the tape being filled with a solid or semi-solid gel derived from a paraffin, vaseline or mineral oil. The layer of tape is surrounded by a helically wrapped or longitudinally extending composite tape having an inner layer of paper filled by said gel and having an outer layer of a thermoplastic material. The layer of composite tape is surrounded by a helically wrapped



or longitudinally extending screen comprising a metal tape coated on its inner and outer surfaces with a thermoplastic material, the inner surface coating being bonded to the outer layer of the composite tape by fusion. The screen is surrounded by a sheath of thermoplastic material having its inner surface bonded by fusion to the outer surface coating of the metal tape.

3,790,695

ELECTRICAL INSULATOR OF POROUS EXPANDED PLASTICS MATERIAL

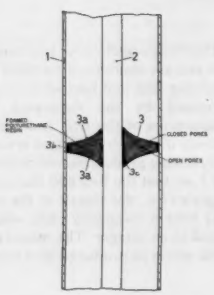
Dieter Floessel, Fislisbach, and Gerhard Mauthe, Wettingen, both of Switzerland, assignors to Brown Boveri & Company Limited, Baden, Switzerland

Filed Sept. 8, 1972, Ser. No. 287,288

Claims priority, application Switzerland, Oct. 29, 1971, 15795/71

Int. Cl. H01b *9/06, 9/04*

U.S. Cl. 174—28 **3 Claims**



An electrical insulator of porous expanded plastics material such as polyurethane for use within metal-clad high-voltage switchgear and lines and which are evacuated prior to being filled with a high-grade compressed insulating gas such as SF_6 having an insulating capacity greater than that of air. Approximately 100 percent of the pores of the expanded plastics material are open pores so as to prevent destruction of the pores during the evacuation phase and thereafter enable the pores to be filled with the insulating gas while in the normal operating condition of the electrical apparatus. If desired, the pores adjacent certain surface zones may be closed so as to reduce the risk of contamination and facilitate cleaning.

3,790,696

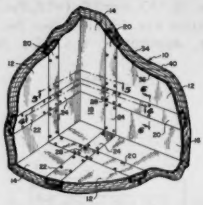
DOUBLE ISOLATED SCREEN ROOM

Erik A. Lindgren, 728 Mulford St., Ill.

Continuation-in-part of Ser. No. 306,607, Nov. 15, 1972. This application Dec. 29, 1972, Ser. No. 319,725. The portion of the term of this patent subsequent to Jan. 1, 1991, has been disclaimed.

Int. Cl. H05k *9/00*

U.S. Cl. 174—35 MS **15 Claims**



A double isolated electrically shielded screen room in which all side, top and bottom panels are identical, and along with preassembled corner units, have identical cross-sectional edges that edge-abut identically for on-the-site assembly. All joints and shielding connectors between contiguous shielding members are cross-sectionally alike and are clamped together in common planes that are parallel to the respective faces of the panels and units to form smooth walls that completely enclose the room as secured under compression in a direction perpendicular to each panel with great isolation efficiency by concealed and isolated clamping means that can be applied from either the inside or the outside of the room assembly.

3,790,697

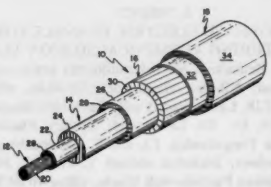
POWER CABLE SHIELDING

Robert P. Buckingham, Wyckoff, N.J., assignor to The Okonite Company, Ramsey, N.J.

Filed Oct. 30, 1972, Ser. No. 301,960

Int. Cl. H01b *7/22*

U.S. Cl. 174—102 **10 Claims**



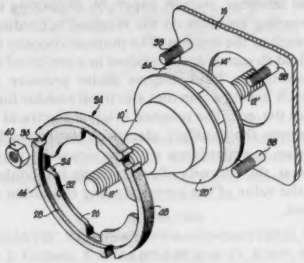
A cable for transmitting electrical power incorporating a shield serving as a low resistance return path to carry heavy fault current. The shield comprises a multiplicity of helically wound elongate metallic elements such as straps, tapes or wires. The lay length of the metallic elements, if tapes or straps, is selected such that thermal expansion and elastic stretch of the straps or tapes is sufficient to accommodate expansion and contraction of the insulator within the elastic limit of the metallic elements. The lay length of the metallic elements, if wires, is selected such that the thermal expansion of the wires is sufficient to accommodate expansion and contraction of the insulator without elastically stretching the wires.

3,790,698

DETACHABLE BUSHING

Fred O. Engert, St. Louis, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed July 25, 1972, Ser. No. 275,068
Int. Cl. H01b 17/30
U.S. Cl. 174—152 R 2 Claims



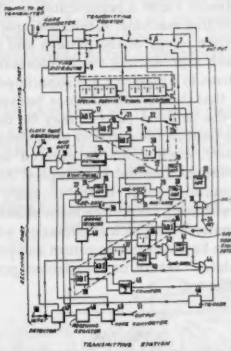
A mounting clamp is provided for detachably securing an electrical bushing upon the wall of an electrical transformer tank in sealing relationship therewith. The clamp is securable to the tank is different dispositions so as to be cooperable with bushings of differing sizes and configurations in detachably mounting same to the tank.

3,790,699

SIMPLEX RADIOTELEGRAPH SYSTEM

Herman Da Silva, Voorburg, Netherlands, assignor to De Staat der Nederlanden te DeZenvertegenwoordigd door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed Apr. 26, 1972, Ser. No. 247,753
Claims priority, application Netherlands, Apr. 28, 1971, 7105791
Int. Cl. H04l 15/22, 15/26
U.S. Cl. 178—2 A 9 Claims



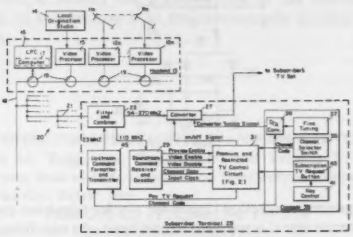
A simplex radio telegraph system with automatic error correction, wherein message signals transmitted to a receiving station are included in time spaced frames. The time space between consecutive ones of said frames being employed by the receiving station to return one of two service signals to indicate to the sending station whether transmission can be continued or a message signal due to an error has to be repeated. Each station is provided with circuitry for sending and detecting, respectively, a third service signal, and additional circuitry for sending and detecting, respectively, a service frame for calling-in said third service signal so as to bring a sending station into its received state, and vice versa. In order to cease established communication(s) to give priority to one or more stations involved in an emergency situation, an auxiliary circuit arrangement is provided by which a station when in its receiving state is able to transmit a fourth service signal. A station when in its sending state can be caused to respond to a fourth service signal through an OR-gate to bring its time distributers into a stand-by state. Alternatively a station when in its receiving state can be caused to respond to a specific service frame through the fore-said OR-gate to bring its time distributors into a stand-by state.

3,790,700

CATV PROGRAM CONTROL SYSTEM

Richard T. Callais, Northridge; Herbert Eisenberg, Manhattan Beach; F. Douglas Forbes, Palos Verdes Peninsula; Thomas J. Kosco, Harbor City; Harry M. Taxin, Los Angeles, all of Calif., and John B. Frost, Goodyear, Ariz., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 17, 1971, Ser. No. 209,222
Int. Cl. H04n 1/44
U.S. Cl. 178—5.1 35 Claims



A system for controlling CATV program viewing in a plurality of modes of operation. In a first mode of operation, a downstream digital transmission causes control means to develop first binary data for comparison in a comparator with selected-channel code data from channel means to enable a first circuit to allow a first or second category program to be selected and received by a subscriber during a predetermined temporary period of time. In a second mode of operation the enabling of a second circuit by the subscriber will only cause the control means to be enabled if the subscriber is authorized to receive that selected first category program. In a third mode of operation the enabling of the second circuit by the subscriber will enable a third circuit to allow a selected second category program to be received. In a fourth mode of operation the selection of a third category program by the subscriber will enable a fourth circuit to allow that selected third category program to be received.

3,790,701

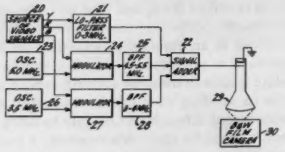
SYSTEM FOR RECORDING AND PLAYING BACK COLOR ENCODED HOLOGRAMS

Gorog Istvan, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 28, 1969, Ser. No. 880,680
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 CD 11 Claims

A hologram record is made containing information representative of the color and brightness of a scene. A replica

of the hologram is played back in a system including a laser imaging unit for producing brightness and color representative



signals which may be applied to a display device for reproducing the scene in its original colors.

3,790,702

GAMMA CORRECTION CIRCUIT

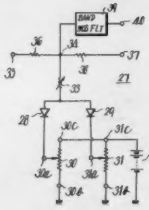
Yasuharu Kubota, and Ryuji Shiono, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1972, Ser. No. 308,654

Claims priority, application Japan, Nov. 27, 1971, 46/95640

Int. Cl. H04n *9/53*

U.S. Cl. 178—5.4 R **16 Claims**



In a gamma correction circuit for a color television camera, a luminance signal is supplied to one input of a non-linear conducting circuit, preferably including at least one semiconductor diode, so as to vary the conductance of such diode, while a chrominance signal is supplied to another input of the non-linear conducting circuit to provide a gamma corrected chrominance signal as the output therefrom.

3,790,703

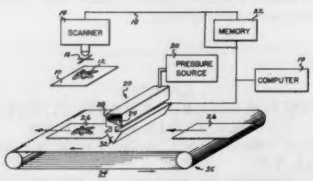
METHOD AND APPARATUS FOR THERMAL VISCOSITY MODULATING A FLUID STREAM

Adam Loran Carley, 45 Linnaean St., Cambridge, Mass.

Continuation-in-part of Ser. No. 46,935, June 17, 1970, Pat. No. 3,741,118. This application July 21, 1971, Ser. No. 164,510

Int. Cl. G01d *15/18*

U.S. Cl. 178—6.6 R **27 Claims**



A method and apparatus for thermal viscosity modulating a fluid stream by time varying the temperature of the stream in response to an intelligence signal. The method and apparatus are useful for "printing" or forming an ink image of an original in black and white or color. In the preferred embodiment, a plurality of fluid printing ink streams are thermal viscosity modulated in response to an electrical signal which represents a scanned original. Each fluid ink stream corresponds to a resolution element across the serially or parallel scanned original. The image of the original is formed or "printed" on a suitable fluid receptor, such as paper, by depositing the fluid streams in varying amounts on the receptor according to the viscosity of each of the streams. The thermal viscosity modulation of the fluid stream is accomplished in a preferred embodiment by passing the fluid streams under pressure through capillaries each having a thin film electrical resistor formed on the inner wall thereof. The scanned original electrical signal is impressed across the capillary electrical resistor to heat the fluid ink stream in accordance with the signal. By varying the amount of heat, the viscosity of each stream is modulated as a function of the value of the corresponding resolution element of the original.

3,790,704

PATTERN CONTROL SYSTEM FOR CONTROLLING TEXTILE MACHINERY

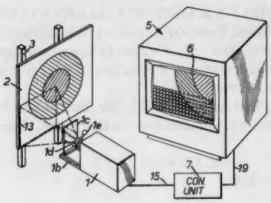
Herbert Collomosse, and Patrick Albert Henry Bacon, both of Croydon, England, assignors to Louis Newmark Limited, Croydon, Surray, England

Filed Dec. 15, 1972, Ser. No. 315,287

Claims priority, application Great Britain, Dec. 17, 1971, 58,633/71

Int. Cl. H04n *7/18, 9/02*

U.S. Cl. 178—6.8 **28 Claims**



A television camera views a representation of a pattern to be knitted by a knitting machine. A television picture tube displays a monochrome image of the pattern and coloured picture elements, each representing stitch information stored at an individual address in a memory, are superimposed upon the pattern image so that the correspondence between the stored information and the original pattern may be determined. A keyboard enables pattern information to be progressively entered in a memory, each stitch so entered appearing immediately as a coloured element in a display. Any portion of the pattern information stored in the memory may be displayed at will. A pulsating marker element shows the position in the displayed pattern at which information will be entered upon actuation of a key. Automatic return and pattern line advance and "tabulator" return to preselected positions in the pattern may be effected.

3,790,705

INTERFERENCE SIGNAL COMPENSATING

Gerhard Robert Kamin, Traisa/Darmstadt, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed Oct. 28, 1971, Ser. No. 193,452

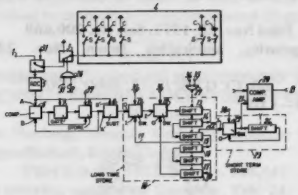
Claims priority, application Germany, Oct. 29, 1970, P 20 53 116.2

Int. Cl. H04n *5/21*

U.S. Cl. 178—7.1 **6 Claims**

Interference in television scanning signals is compensated for by integrating signals from picture areas, converting the in-

tegrated signals to digital pulses, storing maximum pulses, comparing incoming pulse values with maximums, changing



maximums if necessary, and storing difference values in circulating storages, and using the difference values to control a compensating amplifier in a picture signal circuit.

3,790,706

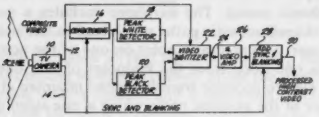
AUTOMATIC VIDEO CONTRAST CONTROL CIRCUIT

Thomas J. Gubala, Renton, and Wayne O. Kraft, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 25, 1972, Ser. No. 256,881

Int. Cl. H04n *5/16*

U.S. Cl. 178—7.1 **9 Claims**



An automatic video contrast control circuit in video signal processing for continuously detecting peak white and peak black levels and providing control signals therefrom to process the incoming video so that contrast is maximized by redefining the video black level and white level of the outgoing video. The method of signal processing comprises detection of the peak white and peak black amplitudes of the incoming video signals and then utilizing the voltage differential between the peak amplitudes to establish a plurality of bias levels for individual voltage level channel comparators which quantize the incoming video into a plurality of successive level signals which when combined and coupled to a display system provide the aforementioned contrast enhancement of the image.

3,790,707

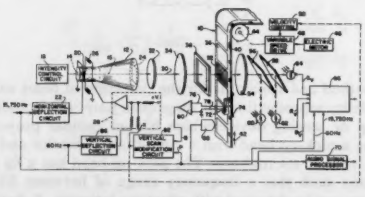
METHOD AND APPARATUS FOR DERIVING A VELOCITY SIGNAL FROM CONTINUOUSLY MOVING INFORMATION BEARING MEDIA

Harry L. Valenta, Jr., North Chili, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 3, 1972, Ser. No. 268,249

Int. Cl. H04n *5/86*

U.S. Cl. 178—7.2 **12 Claims**



The velocity of continuously moving information bearing media, such as perforated motion picture film bearing successive image frames, is derived from the detection of the movement of the image frames past first and second image frame detecting means displaced apart a distance ΔD in the direction of continuous movement and the production of corresponding first and second time-spaced signals having first and second time periods, respectively. Means are provided for transforming the first and second time-spaced signals into a velocity signal, such means including a reference signal having a value representative of the physical distance ΔD, first integrator means responsive to the velocity signal for producing a first ramp signal having a ramp slope dependent upon the value of the velocity signal and a period established by the second signal, difference means responsive to the reference signal and the first ramp signal for producing a second ramp signal representative of the instantaneous difference between the value of the reference signal and the time varying ramp slope of the first ramp signal, second integrator means responsive to the instantaneous amplitude of the difference signal for producing the velocity signal, and gate means responsive to the first signal that operates as a sampling signal for applying the second ramp signal to the second integrator means for a sampling period corresponding to the first period of the first signal, whereby the second integrator means is responsive to the sampled instantaneous value of the second ramp signal during the sampling period to produce the velocity signal having a value representative of the first predetermined rate of movement of the information bearing media and independent of non-uniform spacings of successive image frames. In telecine reproduction apparatus, the first ramp signal may be employed to modify the scanning rate of the telecine apparatus to synchronize it to the continuously moving image frames.

3,790,708

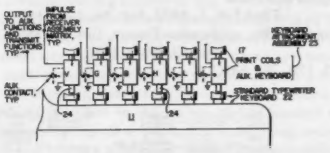
COMMUNICATION METHOD AND APPARATUS

Vernon M. Bugg, Sr., Churchville, and Francis V. Bugg, Towson, both of Md., assignors to Telectrotype Corporation of America, Belair, Md.

Filed Oct. 12, 1972, Ser. No. 296,838

Int. Cl. H04l *15/06, 15/34*

U.S. Cl. 178—17 C **5 Claims**



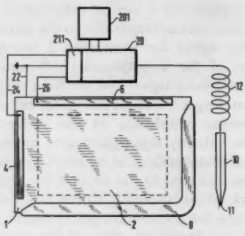
The present disclosure is directed to a communication system employing two typewriters of the electromechanical type each of which is equipped to be both a transmitter and receiver for two-way communication. When employed as a transmitter the first typewriter, upon depression of each keyboard device, initiates an electrical pulse which is passed through an encoding matrix which is responsive and definitive of only one keyboard character and which through a recycling chain counter places the representative pulse, having its identity discernable by its polarity, current or frequency level, on the conductive link between the first and second typewriter. At the second typewriter the incoming signal is received through an electrically selective matrix of switching devices which decode the incoming signal by polarity, current level or frequency. The pulse format is then directed to a second matrix where electrical means responsive to the individual coded characters activate the print out mechanism of the second typewriter to print the message.

3,790,709

DEVICE FOR REGISTERING THE INSTANTANEOUS CONTACT PRESSURE OF A PROBE AND FOR THE ELECTRONIC RECORDING OF THE INSTANTANEOUS LOCATION OF A PROBE ON THE SURFACE OF A PLATE

Walter Heywang, Neukeferloh, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 30, 1972, Ser. No. 239,641
Int. Cl. G08c 21/00
U.S. Cl. 178—18 10 Claims



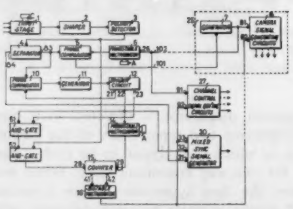
A device for registering the instantaneous contact pressure of a probe which is being used as a writing instrument on a piezoelectric plate or on a sheet of paper resting on a piezoelectric plate, and to the combination of such a device in a system for electronically registering the instantaneous location of a probe on the surface of such a plate. The plate in such a system has permanent polarization in a predetermined direction. Essentially strip-shaped electrodes are arranged at adjacent edges on the upper surface of the plate. The probe is provided with an electrode at its tip and its tip is pressed against the plate, or the paper, when it is being used for writing. The system is designed in particular for the instantaneous recording of a character pattern which is written with a probe, which may, for example, be a pen or a stylus.

3,790,710

SYNCHRONIZING DEVICE FOR A TELEVISION SCANNING EQUIPMENT

Jean Marie Gaucheron, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 1, 1972, Ser. No. 222,515
Claims priority, application France, Oct. 18, 1971, 7137304
Int. Cl. H04n 5/04
U.S. Cl. 178—69.5 DC 2 Claims



All the signals necessary for the operation of the camera are derived, as concerns the line frequency signals, from the output of a generator at the line frequency located in the camera and phase locked to the incoming line frequency sync. signal by means of a feedback loop including a variable delay device, and, as concerns the field frequency signals, from a basic field frequency signal delivered by a circuit comprising means for generating a signal at the frequency 2F, where F is the line frequency and whose phase is determined by the incoming line frequency sync. signal, and a counter fed by the signal at the frequency 2F through a further variable delay device.

3,790,711

STEROPHONY - SIMULATING EARPHONE

Shin Ojima, and Hiroshi Sano, both of Yao City, Japan, assignors to Hoshi Denki Seizo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 22, 1971, Ser. No. 200,669
Claims priority, application Japan, Nov. 24, 1970, 45/117065
Int. Cl. G10k 11/12; H04r 5/00
U.S. Cl. 179—1 GP 6 Claims

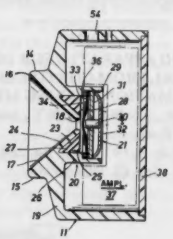
A stereophony-simulating earphone which enables a user of the earphone to hear monaural sound as if it were stereophonic sound. The earphone includes a pair of horseshoe-shaped acoustic paths which lead to left and right ears of the uspr. Mounted at a point on one of the acoustic paths which is one-sided from the midpoint of said one path is a woofer electro-acoustic transducer and mounted at a point on the other of the acoustic paths which is one-sided opposite to said woofer from the midpoint of said other path is a tweeter electro-acoustic transducer. Both electro-acoustic transducers are fed by a common monophonic electrical signal to accomplish excellent stereophonic sound simulation.

3,790,712

ELECTRONIC STETHOSCOPE SYSTEM

Francis M. Andries, Tomball, Tex., assignor to Computer Medical Science Corporation, Tomball, Tex.

Filed Feb. 24, 1972, Ser. No. 229,088
Int. Cl. H04r 1/46; A61b 7/04
U.S. Cl. 179—1 ST 5 Claims



A method and apparatus for the detection of heart sounds and fidelity reproduction for diagnostic purposes including a pick-up or sensing device which has an annular projection forming a pick-up head with a cone-shaped interior and also has a dynamic microphone. The pick-up head has a lip configuration such that a frequency range of between 20 and 1000 cps can be detected with adequate intensity. A dynamic microphone operates a class "A" amplifier to provide amplification without signal distortion. Multiple distribution of de-

tected sound is contemporaneously and simultaneously available to listeners, and at the same time the sound can be recorded on tape. Sound analysis with respect to frequency content and amplitude is made as well as comparison to predetermined heart malfunctions for clinical diagnosis.

3,790,713

FOUR-WIRE SWITCHING OF JUNCTIONS IN TDM PCM SWITCHING CENTERS UNDER STORED-PROGRAM CONTROL

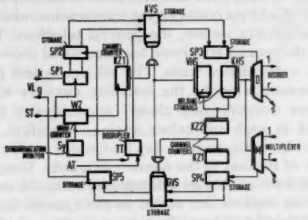
Karlheinz Neufang, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Feb. 23, 1972, Ser. No. 228,541

Claims priority, application Germany, Feb. 24, 1971, P 21 08 745.6

Int. Cl. H04j *3/00*

U.S. Cl. 179—15 AT **3 Claims**



A telephone exchange serving PCM time division four-wire junction lines having switching centers under the control of a stored program central control unit is described. A connecting-through unit including a complete storage device for the incoming and outgoing directions for holding all the information elements arriving during a complete system scanning period, decoupling means for maintaining the separation of the internal and external pulse repetition rates, and a monitoring means for controlling the synchronization signal in the incoming channel, is allocated to each four-wire junction line. Spatial coupling point elements accessed by the four-wire line provide connections between the incoming and outgoing channels. Holding storage devices link each complete storage device and appropriate coupling points. The holding storage devices and coupling points are controlled by a path finding means to provide the required spatial and time coupling between incoming and outgoing channels. The foregoing apparatus removes the need for specially constructed switching centers for use with pulse code modulated signals.

3,790,714

FM STEREOPHONIC RECEIVER

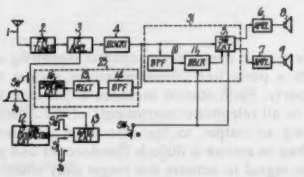
Mitsuo Ohsawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 12, 1971, Ser. No. 161,437

Claims priority, application Japan, July 13, 1970, 45/61153

Int. Cl. H04h *5/00*

U.S. Cl. 179—15 BT **2 Claims**



A receiver for stereophonic program signals which employs a narrow-band intermediate-frequency signal extracting circuit and a noise signal detecting circuit for producing a gate signal. The receiver further includes a change-over switch which is controlled by the gate signal to select the monaural or stereophonic mode of operation so that the receiver may achieve monaural reproduction when noise in the received signal exceeds a predetermined level.

3,790,715

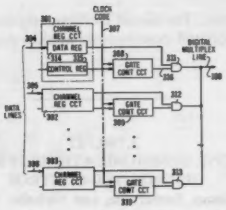
DIGITAL TRANSMISSION TERMINAL FOR VOICE AND LOW SPEED DATA

Hiroshi Inose, Tokyo; Yutaka Masuko, Kawasaki, and Tadao Saito, Tokyo, all of Japan, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1972, Ser. No. 276,082

Int. Cl. H04j *3/16*

U.S. Cl. 179—15 BV **2 Claims**



Apparatus for multiplexing a plurality of speech and low speed data signals on a single data multiplex channel. In order to accommodate the low speed data signals, a time slot of the recurring time multiplex transmission scheme of the time multiplex transmission channel is organized into a plurality of basic data channels corresponding in number to the number of bits which occur in the time slot. Control circuitry is provided for assigning one or more low speed data signal sources to a basic data channel during frames of the recurring cycle. The frame assignment is dependent on the signaling rate of the assigned data signal source. A control register is associated with each low speed data signal source and in order to minimize register size each control register is arranged to store a first set of signals defining one-out-of-*n* bit times in a coded form where *n* bit times occur in each time slot, a second set of signals defining one-out-of-*m* frames in a recurring sequence of *m* frames and to store a third set of signals which define the data rate of the corresponding data signal source.

3,790,716

SYNCHRONIZATION CIRCUIT FOR A PCM-TDM EXCHANGE

Michel Jean Herry, Aulmay-Sous-Bois, and Augustin Lejay, Verrieres-le-Buisson, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

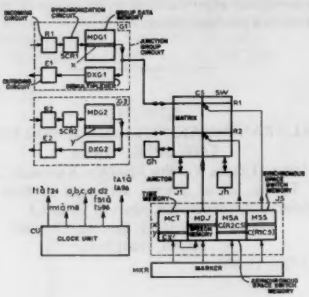
Continuation of Ser. No. 5,381, Sept. 12, 1969. This application Dec. 6, 1971, Ser. No. 205,082

Int. Cl. H04j *3/06*

U.S. Cl. 179—15 BS **2 Claims**

A channel synchronization control circuit is disclosed for a PCM telecommunication system in which for each group of trunks there is provided a synchronization circuit with data memories for each trunk. Each message is constituted by a plurality of digits equal to the number of trunks. Received

message signals are stored in a buffer memory in which the time modification due to failure of channel synchronization



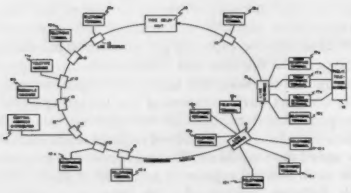
can be corrected. The circuit continuously checks the channel synchronization and continuously applies such corrections as are necessary.

3,790,717

TELEPHONE COMMUNICATIONS SYSTEM WITH DISTRIBUTED CONTROL

Carl N. Abramson, Somerville, and Nicholas A. D'Agosto, III, Piscataway, both of N.J., assignors to Adaptive Technology, Inc., Piscataway, N.J.

Filed Aug. 7, 1972, Ser. No. 278,646
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 AL **35 Claims**



A system for accomplishing distributed PABX functions without tying up lines or channels of communication for each communication. Station identifying address codes are assigned to the subscribers with a plurality of address codes being available to a single subscriber at a given time. The address codes are stored in registers located at the subscriber stations and transferred to receiving stations to effect communication. The processing and handling of the address codes is accomplished locally at the subscriber stations by the user himself by a technique which facilitates the implementation of such conventional PABX functions as call transfer, call storage, call forwarding and call hold. The subscriber terminals are connected in a communications network wherein the subscribers communicate on the transmission media using a predetermined period format. The period format includes assigned portions for handshaking and distribution of address codes as well as portions for communicating textual data. Generally, an originator goes off hook and dials the handshake address code of the party he desires communication with. This address code is placed in a REQUEST FOR SERVICE subperiod of the period (P) on the transmission line. At the receptor terminal, a distributed address code is received for identifying the communications between the two terminals. Each subscriber is provided with registers for storing the address codes to be used by respective communicating subscribers. The possible address codes stored by these registers includes address codes providing handshake identification codes, transferee address codes identifying those subscribers which a given subscriber desires to transfer or forward calls to, the addresses of subscribers calling a given subscriber when such given subscriber is busy with a third party and, essentially, includes the addresses associated with any subscribers which the given subscriber is or will subsequently speak to, or transfer calls to. An address selector and control circuit controls the entry and removal of the address codes into and out of the address registers. The control circuit is connected to both a keyboard for receiving telephone operation command codes, and to an address code detector so as to control the entry and removal of address codes on the transmission media.

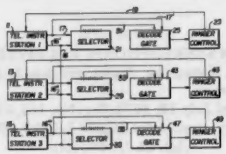
In the subject system, the general telephone functions as well as the special telephone features noted above are available on a distributed basis. The subject system provides the characteristic whereby the interface circuitry to the public telephone network very closely approximates the circuitry required at each subscriber station. Therefore, the system does not have the present day limitations on the ratio of the number of stations to the number of trunks. Since the special features are available on a distributed basis, the cost increases linearly as stations are added to the system. In accordance with the subject system, there is no requirement for a central attendant's terminal or a central switching unit, but rather the basic telephone functions are accomplished on an independent basis by the individual subscriber terminals.

3,790,718

SOLID STATE DIAL SELECTOR SIGNALLING APPARATUS

Edgar W. Jenkins, Jr., P.O. Box 6, Belle Chasse, La.

Filed Dec. 21, 1970, Ser. No. 99,979
Int. Cl. H04m *13/00*
U.S. Cl. 179—17 D **29 Claims**

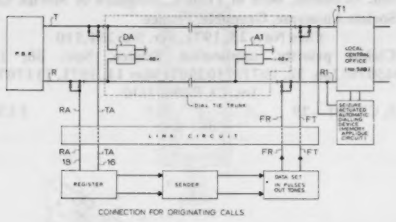


The invention comprises a separate signalling apparatus for use with a party line communications system to signal the called party. Each station includes a dial selector interconnected to all telephone instruments of the other stations for producing an output to the associated decoder and ringer units when its station is dialed. The decoder unit provides a go or no-go signal to actuate the ringer only when its station is being called. Integrated chips and JK flip-flops provide a reliable solid state apparatus. For use with an intercom system, the stations share a single dial selector but the other components are the same.

3,790,719
METHOD AND MEANS FOR CONNECTING BRANCH EXCHANGES

Bernard R. Montague, Dollard des Ormeaux, Quebec; Derek Leyburn, Mississauga, Ontario; John Barker, Richmond, British Columbia; Ray John Hannley, Edmonton, Alberta; Vincent G. Leblanc, St. John, New Brunswick, all of Canada, and Leslie K. Tam, Galion, Ohio, assignors to Bell Canada, Montreal, Quebec, Canada

Filed Oct. 28, 1971, Ser. No. 193,413
Int. Cl. H04m *7/14*
U.S. Cl. 179—18 AD **20 Claims**



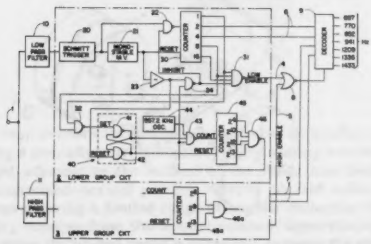
CONNECTION FOR ORIGINATING CALLS

Two private branch exchanges are each associated with different central offices and are connectible to their associated central office by one or more associated trunks. Action initiated by the subset of one of the private branch exchanges to seize an associated trunk, causes connection of that trunk through the conventional telephone system to a trunk associated with the other private branch exchange (preferably through the direct distance dialling network). Seizure by the subset of the associated trunk also causes the seizure of register sender means. After this latter seizure dialled digits are stored in the register sender until the above connection is established. The stored digits are then sent along the connection to achieve connection to the terminating end subset. Preferably the dialled digits are sent over the established connection in the form of tones within the voice band. Preferably the call is timed by a timer optionally associated with either the originating or the terminating end. Preferably the originating and terminating ends are interchangeable.

3,790,720
DIGITAL DECODER FOR MULTIPLE FREQUENCY TELEPHONE SIGNALLING

Knut Roger Schartmann, Montreal, Quebec, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Oct. 27, 1972, Ser. No. 301,506
Int. Cl. G01r *23/10*
U.S. Cl. 179—84 VF **6 Claims**

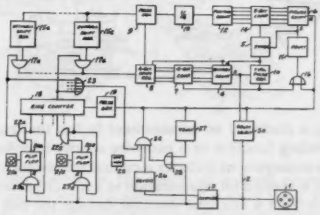


A signal selected from a family of signals having different predetermined frequencies is identified, within predetermined frequency limits. In one embodiment a decoder of the digital type is used to decode multiple frequency telephone signalling. A filter separates two signalling frequency signals into upper and lower frequency groups. Each of the signals is counted in upper and lower group circuits and after a predetermined count, to allow for a settling time, upper and lower group timing interval signals are generated. At the end of the time interval the upper and lower group circuits cease to count. In the continuing presence of the signals the counts are decoded to identify the signalling frequency signals received. The use of digital circuitry yields a space and cost saving over previously used analogue circuitry.

3,790,721
AUTOMATIC DIALING DEVICE

Heinz Muhlbauer, Erchanastrasse 7, Dachau, and Franz Hofstetter, Franz Schellerstrasse 12, Herbertshausen, both of Germany

Filed June 13, 1972, Ser. No. 262,230
Int. Cl. H04m *1/44*
U.S. Cl. 179—90 B **12 Claims**

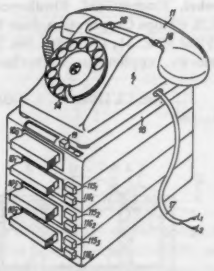


Automatic dialing apparatus in which a plurality of storage registers each containing a representation of a directory number are serially interrogated and are read out in response to the concomitant presence of the interrogating signal and actuation of an associated selecting means to produce calling signals and in which the interrogating means is stepped past a selected register when the called number is busy, when the called party does not answer within a certain period of time or when the call is completed.

3,790,722
MAGNETIC TAPE CARTRIDGE DIALER

Andre Faye, 14, Rue du Foubourg Saint-Honare, Paris, France

Filed Oct. 11, 1972, Ser. No. 296,545
Int. Cl. H04m *1/46*
U.S. Cl. 179—90 BB **5 Claims**



Automatic call transmitter comprising a plurality of cartridge tape recorders and readers with recording heads, readout heads, capstans and capstan motors. Magnetic cartridges can be inserted into these recorders and readers. The capstan of the recorder and reader drives the magnetic tape of the cartridge. Alternating current pulses are generated under

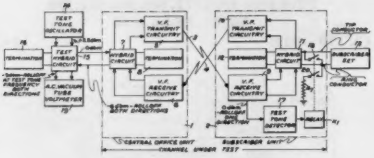
the control of the dial of a telephone set and these pulses are applied to the recording heads and recorded on a cartridge tape. An amplifier is connected to the readout heads for reading out the recorded pulses and the read out pulses are applied to a relay connected in parallel to the dial terminals. The operation of this relay simulates the dial actuation.

3,790,723

TEST ARRANGEMENT FOR A TWO-WIRE TELEPHONE CHANNEL

Edward F. Stewart, Raleigh, N.C., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Oct. 11, 1972, Ser. No. 296,728
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.3 **6 Claims**



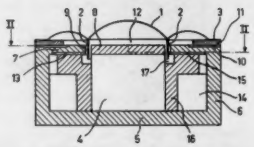
There is disclosed an arrangement to test the transmission and signaling function of a two-wire carrier telephone channel. The arrangement includes a central office unit to which a test tone is applied for transmission to a subscriber unit. At the subscriber unit a test tone detector detects the test tone and actuates a switching arrangement to connect the tip conductor and ring conductor of a subscriber set together so as to cause a mistermination of a hybrid circuit in the subscriber unit thereby causing the test tone to be looped back to the central office unit where the magnitude of the test tone is measured. From the measurement of the test tone a faulty operation of the channel can be detected. The test tone detector includes a tuned circuit tuned to the frequency of the test tone, a precision halfwave rectifier circuit including a first solid state operational amplifier coupled to the tuned circuit and an output circuit including a second solid state operational amplifier coupled to the output of the rectifier circuit and to the tuned circuit to produce a full wave rectified output signal with voltage gain upon detection of the test tone to actuate the switching arrangement.

3,790,724

ELECTROMAGNETIC MICROPHONE INCLUDING AT LEAST ONE ACOUSTIC RESISTANCE

Gerrit Schenkel, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1972, Ser. No. 240,012
Claims priority, application Netherlands, Apr. 1, 1971, 7105001
Int. Cl. H04r *1/28, 9/08*
U.S. Cl. 179—180 **10 Claims**



Electrodynamic microphone provided with a diaphragm having a moving coil which is disposed in the active air-gap of a magnet system.

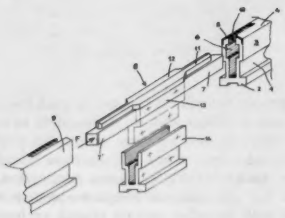
The air volume behind the diaphragm is connected to acoustic resistances. Each acoustic resistance comprises a groove which is pressed in a part of the magnet system made of a sintered material and is covered by a cover plate. The advantage is that in manufacture by mass-production methods acoustic resistances having very small tolerances are obtained.

3,790,725

LINEARLY EXTENDING ELECTRICAL DISTRIBUTION SYSTEM HAVING EXTRUDED SHAPE CONDUCTOR RAILS

Pierre Charamel, Les Cotes de Sassenage, and Raymond Bresson, Grenoble, both of France, assignors to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed Nov. 23, 1971, Ser. No. 201,510
Claims priority, application France, Nov. 30, 1970, 7043078; Jan. 22, 1971, 7102907; May 11, 1971, 7117070
Int. Cl. B60m *1/30*
U.S. Cl. 191—29 **5 Claims**



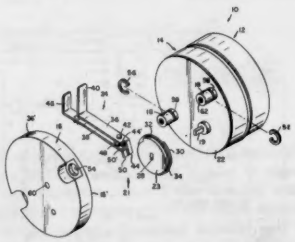
A linearly extending electrical distribution system for a high speed vehicle driving a current collecting head. At least three conductor rails are provided by longitudinal aligned and spaced apart extruded shapes clamped to transverse C-shaped insulating support members. Expansion joints are provided by connector bars in telescoping relationship with the extruded shapes.

3,790,726

CAM OPERATED ELECTRICAL TIMER ASSEMBLY WITH IMPROVED CONTACT AND ASSOCIATED PERIPHERAL RIB CAM

William Ray Brown, Beech Grove, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed June 12, 1972, Ser. No. 262,137
Int. Cl. H01h *43/10*
U.S. Cl. 200—38 B **6 Claims**



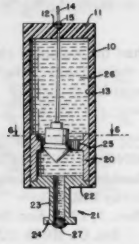
A timer switch utilizing a modular stacked configuration and a switching arrangement wherein one each of a pair of switch blades are responsive to a pair of cam surfaces separated by a peripheral rib of a single cam.

3,790,727

INERTIA SWITCH WITH RESILIENT CONDUCTIVE SUPPORT ARM IMMERSED IN SILICONE BASE VISCOUS FLUID MEDIUM

Gregory L. Laserson, Scarsdale; Harvey Feinman, Bronx; Mille Stand, New York; Stephen G. Glatzer, New Rochelle, and Rocco Scappatura, Mount Vernon, all of N.Y., assignors to Sealectro Corporation, Mamaroneck, N.Y.

Filed Dec. 13, 1972, Ser. No. 314,609
Int. Cl. H01h 35/02
U.S. Cl. 200—61.49 10 Claims



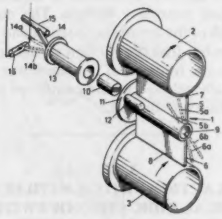
A force actuated electrical switch which discriminates between forces having varying time duration. A pendulum, including a conductive wire secured at one end and fastened to a conductive bob at the other end. The pendulum is enclosed in a cylindrical insulator containing a thick viscous fluid. At the lower end of the cylinder a metal ring is positioned adjacent to the bob and surrounding it. Under normal conditions the bob remains at the center of the ring and there is no contact. When the cylinder is moved in a horizontal direction for an extended time interval, contact is made between the bob and the ring and the switch is closed.

3,790,728

YARN WRAP DETECTOR ASSEMBLY WITH BUTTERFLY TYPE SENSOR AND SWITCH ACTUATOR

Harold Whittaker, Manchester, England

Filed May 30, 1972, Ser. No. 257,785
Claims priority, application Great Britain, June 19, 1971, 28,869/71
Int. Cl. B65h 25/14
U.S. Cl. 200—61.18 6 Claims



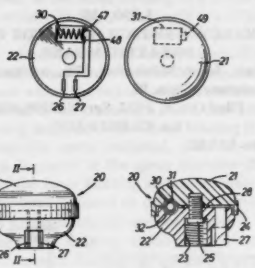
A wrap detector for detecting a yarn wrap on a roller, comprising a pivotally mounted butterfly-type sensing member arranged adjacent to the surface of the roller and having a predetermined normal position relative to said roller, apparatus allowing a limited range of angular deflection of the sensing member from the normal position, apparatus operative, when the limited range is exceeded, to move the sensing member through a greater angle to a limit position lying well clear of the roller, and a switch mechanism actuated by the sensing member when in the limit position to control further yarn feed.

3,790,729

ELECTRIC SWITCH ASSEMBLIES WITH SPRING BIASED ROTATABLE KNOB ACTUATOR FOR GEAR SHIFT LEVER OR THE LIKE

Geoffrey Lionel Guy Bradshaw, York Cottage, Church Rd., Leatherhead, England

Filed Nov. 23, 1971, Ser. No. 201,462
Claims priority, application Great Britain, Nov. 27, 1970, 56,558/70; Apr. 30, 1971, 12,359/71; June 18, 1971, 28,612/71
Int. Cl. H01h 21/24, 9/06
U.S. Cl. 200—61.88 15 Claims



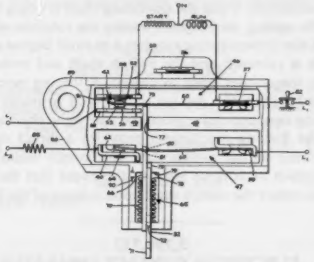
An electric switch in the shape of a knob arranged for mounting on the end of a mechanical control lever, the knob being in two parts of which one is rotatable to perform an electrical switching function. The switch is preferably spring biassed to a 'normal' position by a compression spring lying between the two parts.

3,790,730

SWITCH CONTROL WITH LOST MOTION ACTUATOR

Alvin D. Wyland, Morrison, Ill., assignor to General Electric Company, New York, N.Y.

Continuation-in-part of Ser. No. 246,457, April 21, 1972. This application Oct. 13, 1972, Ser. No. 297,193
Int. Cl. H01h 3/48
U.S. Cl. 200—153 V 17 Claims



A switch control is disclosed for an electric motor having a push collar mounted on a shaft for substantially coaxial movement with respect to the shaft from a first motor run push collar position through successive second, third and fourth push collar imparting switch control operative event positions to a fifth motor stop push collar position. The switch control comprises first means for engaging the push collar with the switch actuator at the push collar second position, and second means for engaging the actuator with a resilient switch blade at the push collar third position. Third means are provided for bring-

ing a mobile switch contact on the resilient switch blade into engagement with an immobile switch contact at the push collar fourth position. The switch control further comprises fourth means for causing the push collar to apply force against the switch actuator at a first rate of force increase as the push collar moves from the fourth push collar position to a push collar position intermediate the fourth and fifth collar positions, and for causing the push collar to apply force against the switch actuator at a second rate of force increase as the push collar moves from the intermediate position towards the fifth push collar position with the second rate of force increase being less than the first rate of force increase.

3,790,731

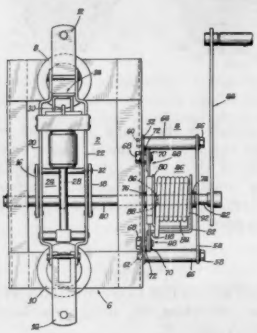
SPRING CHARGING SWITCH OPERATOR WITH WELD-BREAKING MEANS

Kazuo H. Date, South Milwaukee, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Oct. 6, 1972, Ser. No. 295,456

Int. Cl. H01h *3/30*

U.S. Cl. 200—153 SC **5 Claims**



A switch operator is provided in which an operating shaft is rotatable in opposite directions to charge a torsion spring for supplying a snap action opening or closing operation of a switch. The switch is operated by a switch shaft which is latched stationary while the operating shaft is being rotated to charge the spring. At the point during the rotation of the shaft at which the torsion spring reaches a desired degree of charge, the latch is released and the switch shaft and switch are allowed to snap either open or closed. A forcing mechanism is positioned within the torsion spring and provides a direct, non-spring connection between the operating shaft and switch shaft. The forcing mechanism provides a direct opening or closing force on the switch shaft and switch means to overcome friction or contact weld in the event that the spring is unable to rotate the switch shaft upon release of the latch.

3,790,732

ELECTRICAL CONTACT APPARATUS

Ernst Slamecka; Hans Kapltany, and Egon Zemann, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munchen, Germany

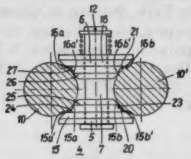
Filed Aug. 10, 1972, Ser. No. 279,383

Claims priority, application Germany, Aug. 12, 1971, 2141138

Int. Cl. H01h *1/06*

U.S. Cl. 200—166 BB **8 Claims**

Electrical contact apparatus for high voltage circuit breakers and the like includes a pair of conical rollers mounted on a shaft and held under spring compression against a pair of conducting pins which are movable with respect to each other, upon the energization of the breaker. Each conical roller has a peripheral groove formed therein, the radius of the groove being less than the radius of either pin. The wedges of the grooves engage the surfaces of the pins to make an electrical connection therewith.



3,790,733

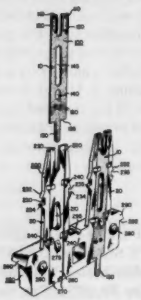
CONTACT SPRING AND SWITCH CONSTRUCTION

Karl-Heinz Pohl, Boulder, Colo., assignor to Bell Telephone Laboratories, Murray Hill, N.J.

Filed Nov. 3, 1972, Ser. No. 303,497

Int. Cl. H01h *1/26*

U.S. Cl. 200—166 J **20 Claims**



The contact spring of this invention comprises a dielectric spring member having a base portion and a generally linear cantilever portion extending from the base portion. A generally linear discrete conductor is mounted on the spring member in close proximity thereto. The conductor extends along the length of the cantilever portion and is so mounted on the spring member that the portion of the conductor extending adjacent to the free end of the cantilever portion is movable longitudinally relative to the cantilever portion when the cantilever portion is deflected.

3,790,734

ALTERNATE ACTION SWITCH WITH SEALING BOOTH GIVING VISUAL INDICATION OF SWITCH POSITION

Andrew F. Raab, Morton Grove, and William J. Schaad, Winnetka, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

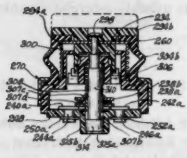
Continuation-in-part of Ser. No. 73,295, Sept. 18, 1970, abandoned. This application Nov. 12, 1971, Ser. No. 198,328

Int. Cl. H01h *13/06, 13/56, 9/16*

U.S. Cl. 200—168 G **11 Claims**

The illustrated switch comprises a push button which is movable in a casing and is enclosed by a boot made of flexible material. A latching mechanism is provided in the casing to retain the push button in a partially depressed position after alternate depressions of the push button. The mechanism

causes the push button to return to its fully extended position after the intermediate depressions of the push button. The end of the boot is caused to follow the movement of the push button, preferably by means of a disk on the push button which is received in an annular groove within the boot, or by clamping a flange on the boot between two disks on the push button. Thus, the length of the boot indicates the position of the push button. A contactor is connected to the push button and is movable to different positions corresponding to the fully extended and partially depressed positions of the push button. A stem or pin is provided between the push button and the contactor. The stem also extends through a latch which is rotatable in successive steps by the operation of the push button. In



alternate positions of the latch, it engages elements on the casing which retain the push button in its partially depressed position. Camming elements are provided on the push button, the latch and the casing to rotate the latch, with the assistance of a spring, mounted on the stem and acting between the contactor and the latch. The contactor may engage a set of contacts in the partially depressed position of the push button. In a modified construction, a second set of contacts is also provided for engagement by the contactor in the extended position of the push button. To provide a make-before-break action, the contactor may comprise two disks with a spring therebetween, slidably mounted on a sleeve which in turn is slidably mounted on the pin or shaft.

3,790,735

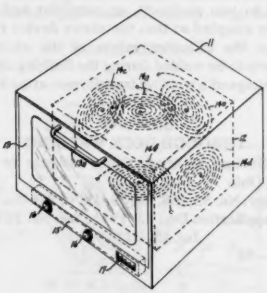
INDUCTIVE HEATED BAKE OVEN

Philip H. Peters, Jr., Greenwich, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Filed Oct. 6, 1971, Ser. No. 186,961

Int. Cl. H05b *5/04*

U.S. Cl. 219—10.49 **24 Claims**



An inductively heated bake oven for heating and warming cookware disposed in the oven comprising an outer housing fabricated from a magnetically non-permeable material and having a plurality of different sides joined together to form an enclosed space with one of th sides forming a door to provide access to the enclosed space. An inner housing is supported within the outer housing and may be fabricated from magnetically susceptible metal material or insulating material and have a plurality of different sides joined together to form an enclosed oven space. The inner housing is spaced from and supported within the sides of the outer housing with the side of the inner housing facing the door of the outer housing being open or accessible to provide access to the interior of the inner housing. A plurality of inductive heating coils preferably of planar, helically wound, pancake-shaped heating coil design are supported within the space intermediate the respective confronting sides of the inner and outer housings and arranged to maximize the inductive coupling to magnetically susceptible metal material either comprising the inner housing or supported within the inner housing if it is of insulating material. Electric circuit means is provided for electrically exciting the inductive heating coils at relatively high frequency of the order of 20 kilohertz to thereby magnetically induce the generation of heat in the inner housing or a metal based cookware disposed within the inner housing if it is of insulating nature. The outer housing may be formed of aluminum, copper or other highly conductive metal material which serves as an effective magnetic shield to confine the magnetic induction field to the space within the outer housing, and the inner housing may be formed of iron, stainless steel, titanium or the like or of an insulating material. If the inner housing is formed of a magnetic susceptible metal material, such as iron, stainless steel, insulation is placed in the space between the induction heating coil and the inner housing and the interior of the inner housing may be porcelainized or otherwise provided with an attractive, easy to clean interior surface similar to known oven interiors. If the inner housing is fabricated from insulating material, a pyroceramic insulating material, high temperature glass, etc. may be used. Preferably, individual excitation circuits are provided for each induction heating coil and the individual excitation circuits can be individually controlled to excite any desired number of coils. Preferably, a plurality of coils are provided one on each of five different sides of the oven so as to assure uniform and even heating of the interior of the oven. Temperature sensor units may be employed for sensing the actual temperature of the inner housing, or a metal base cookware disposed in the inner housing space. Cooling vents may be formed in either the inner or the outer housing or both to provide for removal of moisture in the oven space as well as to provide a flow of cooling air across the induction heating coils thereby maintaining their resistance at a low value and improving the overall efficiency of operation of the bake oven. If desired, self-cleaning of the oven can be provided for the inner housing member, if formed of a magnetically susceptible metal material, by raising its temperature to sufficiently high value to achieve self-cleaning action. The inductive heating coils may be a helix wound from electrically insulated Litz wire or the like, or may be fabricated from a helix cut out of sheet metal.

3,790,736

HEATING ROLLERS

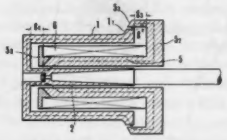
Shinji Matsumura, and Mitsuhiro Konno, both of Tokyo, Japan, assignors to Koshei Arita, Ohta-ku, Tokyo, Japan

Filed Nov. 21, 1972, Ser. No. 308,397

Claims priority, application Japan, Oct. 21, 1972, 47-105664

Int. Cl. H05b *5/08*

U.S. Cl. 219—10.49 **9 Claims**



In a heating roller of the type comprising a cylindrical cup shaped magnetic roller, a magnetic boss at the center of the

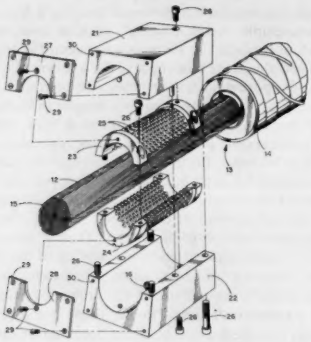
inner surface of the bottom of the roller, a driving shaft connected to the boss, a stationary magnetic sleeve surrounding the boss and the shaft, a magnetic radial flange secured to one end of the sleeve to confront the open end of the roller and an exciting coil disposed in a space between the roller and the sleeve, a magnetic ring is secured to the outer end of the radial flange to extend in the axial direction for surrounding the peripheral surface of the open end of the roller with a narrow air gap therebetween.

3,790,737

PREPARING CABLE FOR SPLICING

James L. Stoneberger, Topsfield, and Charles B. Sylvester, Boxford, both of Mass., assignors to Utec Constructors, Inc., Lynnfield, Mass.

Filed Mar. 29, 1972, Ser. No. 239,295
Int. Cl. B23k *9/04*
U.S. Cl. 219—76 **2 Claims**



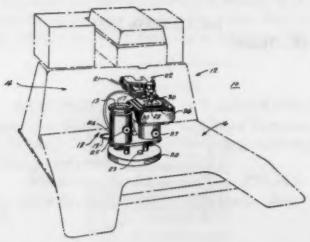
A high vacuum chamber surrounds each exposed end of a segmented aluminum conductive paper insulated cable for preventing the oil from the impregnated cable insulation from migrating to the end of the conductor after the aluminum conductor is cleaned with solvents to permit heliarc welding or buttering of the end of the conductor prior to splicing.

3,790,738

PULSED HEAT EUTECTIC BONDER

Joseph L. Laub, Claremont, and Derek Jenkins Griffiths, Arcadia, both of Calif., assignors to Unitek Corporation, Monrovia, Calif.

Filed May 30, 1972, Ser. No. 257,782
Int. Cl. B23k *1/02*
U.S. Cl. 219—85 **14 Claims**



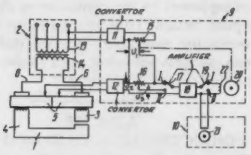
A pulsed heat hybrid semiconductor die bonding apparatus utilizing a pair of heating electrodes which bracket a die collet and contact the substrate area immediately adjacent each side of the die or chip to be bonded. A heating pulse of a predetermined magnitude and duration produces localized substrate heating via a discharge of current to the metalization under the chip. A conductivity monitor connected to the electrodes indicates the quality of the electrical contact of the heating electrodes with the substrate. Simultaneous with the substrate heating current pulse, a low frequency, unidirectional mechanical scrubbing motion is applied to the arm holding the die collet. The arm is supported in the apparatus by means of a flexure type of mounting. The combination of heating current applied to the substrate in pulses with scrubbing action precisely controls the heating and eutectic bonding of the substrate and chip, preventing subsequent unbonding or heat damage to the semiconductor die. The bonding arm mechanism accepts quickly interchangeable, floating die collet tools.

3,790,739

MACHINE FOR CONTINUOUS FLASH BUTT-WELDING OF PARTS

Viktor Senderovich Lifshits, Kavkazsky bulvar, 21 Korpus 2, kv. 41; Vladimir Rubenovich Andrianov, Proezd Zarevy, 3, kv. 19; Nikolai Nikolaevich Rykalin, Ulitsa Akademika Gubkina, 4 kv. 64; Tibor Ferentsevich Krasnev, Slarokerpechny Pereulok 4, kv. 1, all of Moscow; Nikolai Vasilievich Podola, Kiev, ulitsa Pushkinskaya 8, kv. 12, and Vadim Petrovich Krivonos, Kiev, ulitsa Repina, 13, kv. 1, both of Kiev, all of U.S.S.R.

Filed July 10, 1972, Ser. No. 270,284
Int. Cl. B23k *11/04*
U.S. Cl. 219—97 **3 Claims**



A machine for continuous flash butt-welding in which a movable clamp automatic rate-of-travel control device for use during flashing comprises two a.c. to d.c. convertors, two potentiometers, two synchronized switches either of which might be set to two positions, an amplifier and a reversing electric motor coupled so that the above device regulates the ratio between the effective values of the electric voltage across the parts to be welded during the flashing operation and secondary voltage of a welding transformer at no-load.

3,790,740

THROUGH DECK WELDING

Thomas E. Shoup, Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 53,368, July 9, 1970, Pat. No. 3,736,401.
This application Dec. 13, 1971, Ser. No. 207,690
Int. Cl. B23k *9/00*
U.S. Cl. 219—98 **1 Claim**

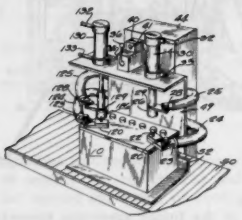
This invention is directed to a drawn-arc welding gun with means for providing a rotary flow of air, or stream of fluid, around the weld area. This invention is also directed to ferrules which are designed to enhance movement of air or fluid around the weld area.

3,790,741

METHOD FOR FABRICATING A THREADED STUD IN A BATTERY POST

Daniel Orlando, New Berlin, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Jan. 8, 1973, Ser. No. 321,824
Int. Cl. H01m 5/00; B23k 11/02
U.S. Cl. 219—107 14 Claims



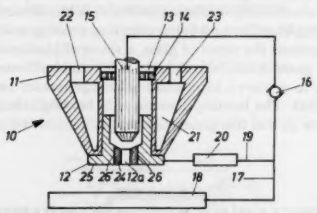
A threaded stud is secured in a battery post fabricated from the usual lead alloys by simultaneously applying a force and welding current to the threaded member so as to melt portions of the lead post while forcing the threaded member into the post. The force and the welding current are controlled in such a manner to prevent overheating of the stud and arcing of welding current. This control can be effected by the intermittent application of welding current with constant application of force on the stud. In one embodiment, the post is provided (preferably by drilling) with a slightly undersized passage and in an alternative embodiment, a hollow, threaded member is utilized without providing the passageway. An apparatus is also described for driving and welding the threaded member into the post which allows for intermittent welding and driving as well as a combined positioning and welding electrode member for the threaded stud and battery post.

3,790,742

NOZZLE

Rupert Auer, Frankfurt/Main, Germany, assignor to Messer Griesheim GmbH, Frankfurt/Main, Germany

Filed Aug. 16, 1972, Ser. No. 281,137
Claims priority, application Germany, Aug. 24, 1971, P 21 42 331.4
Int. Cl. B23k 9/00
U.S. Cl. 219—121 P 7 Claims



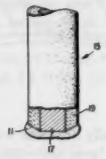
Disclosed is a nozzle for a welding or plasma torch. The nozzle has an inner and an outer housing, each made of a different material. Thus, the inner housing, through which passes the plasma arc, is made of a highly heat resistant meterial. The outer housing is made of a highly heat conductive material for quickly conducting heat away from the inner housing.

3,790,743

WELDING ELECTRODE HAVING A NON-CONDUCTIVE TIP FOR SEMI-AUTOMATIC CONTINUOUS ARC WELDING MACHINE

Shinji Kimura, Fujisawa; Norihiro Fukui, and Yasuhiro Nagai, both of Kamakura, all of Japan, assignors to Kobe Steel, Ltd., Kobe City, Hyogo-Prefecture, Japan

Filed Mar. 18, 1970, Ser. No. 20,491
Claims priority, application Japan, Mar. 31, 1969, 44-24548
Int. Cl. B23k 9/00
U.S. Cl. 219—130 3 Claims



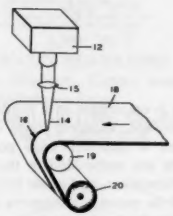
A coated welding electrode for use in a semi-automatic continuous arc welding apparatus is provided with a layer of predetermined thickness of a material which is electrically insulative at normal atmospheric temperature painted on the tip end thereof.

3,790,744

METHOD OF FORMING A LINE OF WEAKNESS IN A MULTILAYER LAMINATE

William Edmund Bowen, Trenton, N.J., assignor to American Can Company, Greenwich, Conn.

Filed July 19, 1971, Ser. No. 163,567
Int. Cl. B23k 27/00
U.S. Cl. 219—121 LM 30 Claims



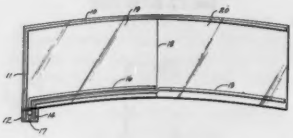
A method of forming a line of weakness in at least one but not all layers of multilayer laminate which comprises effecting relative movement between a beam of radiant energy of a particular predetermined wavelength and intensity and the laminate so that the energy is selectively relatively absorbed by at least one layer in an amount and manner that alters the structure of the layer and thereby forms a line of weakness in the laminate. The source of radiant energy preferably is a laser. The laminate layers can be comprised of any material used in manufacturing multilayer packaging laminates such as thermoplastics, thermosets, paper and foil. Preferably, the laminate includes at least one layer of thermoplastic material. The layer that absorbs more energy can be an adhesive.

3,790,745

TEMPERATURE CONTROL FOR ELECTRICALLY HEATABLE WINDOW

Berton P. Levin, Santa Monica, Calif., assignor to The Sierracin Corporation, Sylmar, Canada

Filed Oct. 13, 1972, Ser. No. 300,403
Int. Cl. B60l *1/02*
U.S. Cl. 219—203 15 Claims



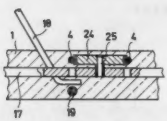
A laminated electrically heatable window has a transparent electrically conductive layer embedded in the window to act as a sheet resistor, and a conductive bus bar in contact with the resistive layer. A portion of the bus bars extends outside an edge of the window for making electrical contact with a power supply such as an automobile alternator. The temperature sensor for preventing overheating of the windshield is mounted in thermal contact with at least one of the bus bars external to the edge of the window rather than in thermal contact with the window itself.

3,790,746

STRUCTURAL ELEMENT OF REINFORCED CONCRETE

Heinrich Krieger, am Bernbaum 57, Wiesbaden-Sonnenberg, Germany

Filed Oct. 28, 1971, Ser. No. 193,281
Claims priority, application Germany, Nov. 5, 1970, 7040944; Aug. 4, 1971, 2138961; Apr. 27, 1971, 7116248
Int. Cl. H05b *1/00*
U.S. Cl. 219—213 5 Claims



A heating cable is embedded in a reinforced concrete slab in serpentine formation, adjacent loops of the cable having bent over portions at opposite edge portions of the slab. Mounting supports are embedded in the slab and hold the cable in the loop formation, and guide members are affixed to respective ones of the mounting supports at the opposite edge portions for guiding the bent-over loop portions and for tensioning the heating conductor.

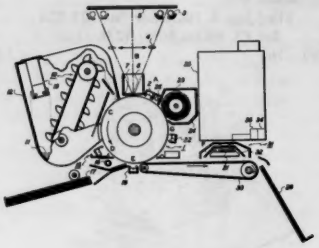
3,790,747

REGULATOR FOR XEROGRAPHIC FUSING APPARATUS

Uldis Klavsons, Fairport, and Thomas B. Michaels, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1971, Ser. No. 211,381
Int. Cl. H05b *1/00*
U.S. Cl. 219—216 9 Claims

Electrical fusing apparatus for intermittent operation is controlled by maintaining the apparatus at a bias temperature during standby and by varying the length of its warm up period inversely proportional to the duration of a minimum standby period. During the warm up period, an auxiliary heating element is actuated and a boost power level is employed to accelerate the rise of the fusing apparatus temperature to a desired level for bonding or fusing particles to a support.

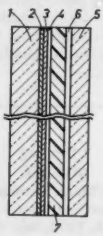


3,790,748

MIRROR HAVING ELECTRICAL HEATING MEANS

Robert Van Laethem, Loverval; Pol Baudin, Ransart, and Jean-Claude Hoyois, Gilly, all of Belgium, assignors to Glaverbel, Watermael-Boitsfort, Belgium

Filed June 9, 1972, Ser. No. 261,420
Claims priority, application Great Britain, June 9, 1971, 19736/71
Int. Cl. H05b *1/00*
U.S. Cl. 219—219 20 Claims



A mirror comprising a sheet of chemically tempered glass has a light reflecting coating on one face thereof and an electrically conductive heating element positioned either on the other face of the glass or on a face of a second glass sheet. A layer of electrically insulating material is positioned between the heating element and light reflecting coating and this layer may constitute the sheet of glass, a sheet of plastic, or a space having a gaseous medium therein. The heating element is connectable to a source of electricity and generates heat by the Joule effect. The heating element is in heating relationship to the mirror so that this generated heat is transmitted to the mirror.

3,790,749

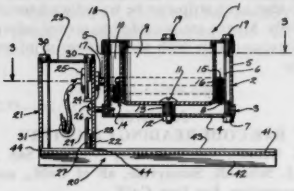
ELECTRIC LEAD POT WITH INCREASED EFFICIENCY

Richard J. Lee, R.R. No. 2, Hartford, Wis.

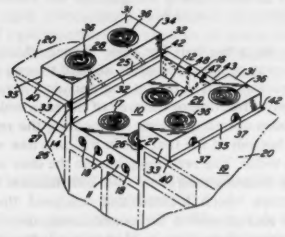
Filed Mar. 26, 1973, Ser. No. 344,733
Int. Cl. F27b *14/06*
U.S. Cl. 219—424 4 Claims

An electrically heated lead melting device includes a thin steel pot disposed within a bright aluminum housing of high reflectivity, with a substantially dead air chamber therebetween. An electric heating coil surrounds the pot within the chamber, with the straight cold ends of the coil

passing horizontally into a control box mounted on a base. A single screw and the said coil ends provide the sole support for the pot-housing assembly, which is disposed substantially above the base. The control box may contain suitable temperature regulation mechanism. The construction provides a minimum of contact between the box and base, as well as providing for upward movement of cooling air through the box.

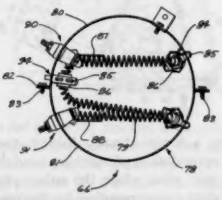


3,790,750
KITCHEN RANGE WITH FOLDING HEATER UNITS
Anthony J. Giannini, 530 Wayne Dr., King of Prussia, Pa.
Filed Jan. 12, 1973, Ser. No. 323,117
Int. Cl. H05b *3/68*
U.S. Cl. 219—444 **9 Claims**



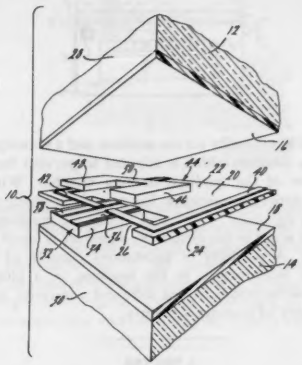
A kitchen range is disclosed which includes a center section with a plurality of fixed electrical resistance heaters and side electrical resistance heater units hingedly connected to the center section for outward disposition for increased capacity and storable thereon in out of use position providing a flat work surface, with provisions for deactivation of all the heaters when the movable units are stored.

3,790,751
HEATER ASSEMBLY FOR DRYER
L. Dean Kuhn, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa
Filed July 24, 1972, Ser. No. 274,646
Int. Cl. H05b *3/06*
U.S. Cl. 219—525 **7 Claims**



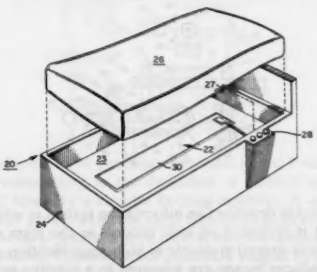
An electric heater assembly includes a housing comprising a pair of generally similar wall portions and further includes an elongated heating coil supported from the inside of said housing by a plurality of spaced and staggered insulating support members in a sinuous path extending transversely back and forth in a first plane and in a second plane. The coil is assembled to the respective wall portions while they are in an openly accessible side-by-side relationship. The wall portions are then closed like a clamshell to form the heater assembly with the coil supported on the interior surface thereof.

3,790,752
HEATABLE LAMINATED WINDSHIELD CONSTRUCTION
Premakaran T. Boaz, Southgate, and Roman Surowiec, Center Line, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Mar. 26, 1973, Ser. No. 345,168
Int. Cl. H05b *3/06*
U.S. Cl. 219—522 **4 Claims**



A heatable, laminated windshield construction is disclosed in which an electrical connection is made to a transparent interlayer which has a conductive coating thereon. When power is supplied to the conductive coating, the result is a heating of the windshield. The connection to the conductive coating is completely sealed so that the moisture is unable to penetrate the laminated construction.

3,790,753
WATER BED HEATER
Robert C. Miller, Madison, Conn., assignor to Safeway Products, Inc., Middletown, Conn.
Filed Dec. 1, 1971, Ser. No. 203,535
Int. Cl. H05b *3/34*
U.S. Cl. 219—528 **6 Claims**



Two sheets of a styrene-butadiene (SBR) type rubber molded together totally encapsulating a heating wire network

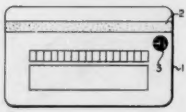
and a crimp-set overheat thermostat provide a greatly improved water-proof water bed heater. By incorporating a hydrostatic pressure resisting shield or cover for protection of the crimp-set thermostat, and by using uncured styrene-butadiene type rubber, an efficient, economical water bed heater is manufactured by vulcanization under high fabrication pressures which exceed the normal thermostat pressure tolerances.

3,790,754

SECURITY ACCESS MEDIUM

Robert Black, Kenley; David Provan, Mitcham, Surrey, and Christopher Rainey, Croydon, all of England, assignors to Burroughs Machines Limited, Detroit, Mich.

Filed Aug. 4, 1972, Ser. No. 278,070
Int. Cl. G06k *5/00, 19/06*
U.S. Cl. 235—61.7 B **42 Claims**



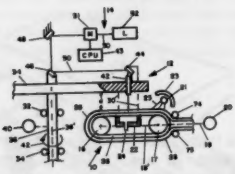
Disclosed is a security access medium and a security system utilizing the medium which is adapted to prevent fraudulent reproduction of the medium bearing member. Within the system the data representation has a predetermined relationship with a signature "developed" from the medium. When the medium is not in the system the signature is latent and not dectaotable. A plurality of substances capable of bearing records are incorporated in the medium, as a plurality of paramagnetic materials having different coercivity, to permit "development"of a secure signature.

3,790,755

HIGH DENSITY INFORMATION SYSTEM USING MULTIPLE STRIPS

Daniel Silverman, 5969 S. Birmingham, Tulsa, Okla.

Continuation-in-part of Ser. No. 888,461, Dec. 29, 1969, which is a continuation-in-part of Ser. Nos. 304,789, Aug. 27, 1963, Pat. No. 3,523,183, and Ser. No. 158,000, Dec. 8, 1961, Pat. No. 3,179,001, and Ser. No. 612,698, Jan. 30, 1967, Pat. No. 3,550,085, and Ser. No. 721,998, April 17, 1968, and Ser. No. 67,135, Aug. 26, 1970, abandoned, said Ser. No. 612,698, Continuation-in-part of Ser. No. 462,679, is a continuation-in-part of Ser. No. 462,679, June 9, 1965, Pat. No. 3,322,033, which is a continuation-in-part of Ser. No. 158,000, Dec. 8, 1961, Pat. No. 3,179,001. This application Dec. 8, 1970, Ser. No. 96,186
Int. Cl. G06k *7/00*
U.S. Cl. 235—61.11 E **37 Claims**



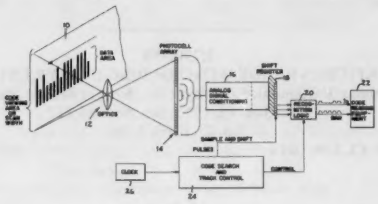
This invention describes an information system in which the information is recorded on strip records in the form of patterns of closely spaced magnetic or high-magnification-optical spots. Transducer means are mounted in a rotating scanning assembly. The strip to be transduced is constrained to be moved longitudinally in a "strip" plane which is parallel to and precisely spaced from the plane of the scanning assembly. The longitudinal direction of the strip is radial to the scanning assembly. A plurality of strips, each in separate strip handling means are positioned radially, equally spaced around the axis of rotation of the scanning assembly. An equal number of transducer elements are equally spaced around the scanning assembly so that each strip can be transduced simultaneously or sequentially. Means are provided to record information on one strip simultaneously with the reading of information on another strip.

3,790,756

BAR CODE READING CIRCUITRY

Kenneth E. Graves, Saratoga; Kay Madsen, San Jose, and Warren J. Schmidt, Sunnyvale, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Nov. 8, 1972, Ser. No. 304,870
Int. Cl. G06k *7/10;* **G08c** *9/06*
U.S. Cl. 235—61.11 E **14 Claims**



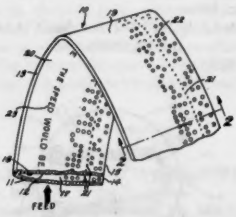
Circuitry for a bar/half bar code reader which includes a stationary array of photodetectors aligned to scan over a relatively large scan width to detect and decode a data line which occupies only a fraction of the area of the scan width. The circuitry includes counting means for locating the relative position of the bottom of the first bar in the data line with respect to the scan width. The remaining bars in the data line are then tracked by interrogating only the information from those photodetectors which located and analyzed the first bar. Means are also provided for continuously determining the relative position of the bottom of each bar in the data line and for incrementally adjusting the tracking circuitry so that codes which are skewed with respect to the scan width can be successfully tracked.

3,790,757

DATA RECORDING AND READOUT TAPE

Joseph Denman Shaw, 508 Church St., Brownsville, Pa.

Filed July 18, 1972, Ser. No. 272,772
Int. Cl. G06k *19/00*
U.S. Cl. 235—61.12 R **8 Claims**



A tape having a longitudinally folded, two-ply structure adapted for the recordation of machine readable language on at least one of said plies while the other ply is adapted to receive printed data corresponding to the machine readable language in an arrangement whereby upon unfolding of the tape the printed data is visible to an operator as the corresponding language is sensed and read out by the tape reader.

3,790,758

CARD READER

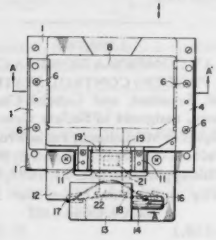
Shizuhiko Tanigawa, Moriguchi; Shinzaburo Ishikawa, and Natsumi Ono, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 19, 1972, Ser. No. 264,331

Claims priority, application Japan, June 22, 1971, 46-54317[U]; June 22, 1971, 46-54318[U]; June 22, 1971, 46-54319[U]

Int. Cl. G06k 7/01

U.S. Cl. 235—61.11 R 8 Claims



A card reader for reading the predetermined information stored on a card, comprising a card kicker plate slidable in the direction of card insertion and capable of contacting with the end of an inserted card. After reading an inserted card, the card kicker plate is moved to elevate the read card from the device by a certain amount, thereby making the ejection of the card easy.

3,790,759

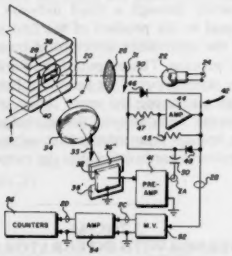
PITCH MATCHING DETECTING AND COUNTING SYSTEM

William L. Mohan, and Samuel P. Willits, both of Barrington, Ill., assignors to Spartanics, Ltd., Village of Palatine, Ill.

Division of Ser. No. 780,367, Dec. 2, 1968, Pat. No. 3,581,067. This application Mar. 4, 1971, Ser. No. 120,889. The portion of the term of this patent subsequent to May 25, 1981, has been disclaimed.

Int. Cl. G06m 9/00

U.S. Cl. 235—92 SB 34 Claims



An apparatus for counting stacked sheet-like materials having no sheet separation requirements. The active area of the sensor array is matched to the width of a sheet of the stack and the sensor array caused to traverse the stack, the complex signal output of the sensor array being stripped of the unwanted components in a high gain, diode clamped capacitive input operational amplifier whose square wave output is processed and counted in conventional counting circuits.

3,790,760

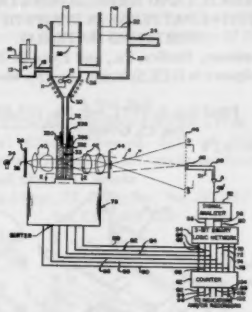
APPARATUS FOR COUNTING, DIFFERENTIATING AND SORTING PARTICLES ACCORDING TO THEIR MICROSTRUCTURE VARIATIONS

Paul F. Stiller, Clarence, N.Y., assignor to Cornell Aeronautical Laboratory, Inc., Buffalo, N.Y.

Continuation of Ser. No. 877,729, Nov. 18, 1969, abandoned. This application Sept. 27, 1971, Ser. No. 184,183

Int. Cl. G06m 11/02

U.S. Cl. 235—92 PC 45 Claims



An apparatus for counting and sorting the formed elements of blood, comprising the phase illumination of sample flow through a microcapillary passage, photodetectors responsive to the microstructure of the formed elements, a signal analyzer responsive to the photodetectors, a logic network for generating control signals, a sorter responsive to the control signals for separating and collecting the formed elements.

3,790,761

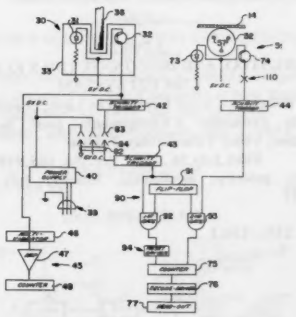
MACHINE FEED AND OUTPUT MONITORING APPARATUS

Charles R. Crabtree, P.O. Box 179, Seagrove, N.C.

Filed Sept. 29, 1971, Ser. No. 184,807

Int. Cl. D04b 37/02

U.S. Cl. 235—92 PD 8 Claims



An electric pulse generator of photoelectric form emits pulses corresponding to the formation of discrete courses in a knitted fabric by a circular knitting machine. A second electric pulse generator of the same type emits pulses corresponding to units of length of yarn used in the formation of each discrete course. The two sets of pulses are shaped by shaping circuits, forming input signals for logic circuits and a counting circuit. In the logic circuits, the signals corresponding to course formation control input to the counting circuit of the signals corresponding to units of yarn length. In the counting

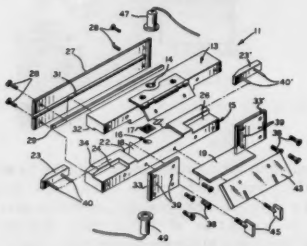
circuit, units of length of yarn are accumulated during the formation of selected courses and visually displayed on a read-out panel. A second counting circuit may be used to accumulate a continuous count of courses in the knitted fabric. A metering unit associated with the second electric pulse generator includes a measuring-wheel-enclosing housing assembly, telescopically assembled and disassembled. The metering unit is mounted as a portable hand unit.

3,790,762

APPARATUS AND METHOD FOR COUNTING REPETITIVE PATTERNS IN STRIPS OF MOVING APERTURED MATERIAL

James C. Redman, Hadley, Pa., and Lynn E. Trent, Shawnee, Okla., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Jan. 6, 1972, Ser. No. 215,853
Int. Cl. G06m *1/272*
U.S. Cl. 235—92 V **5 Claims**



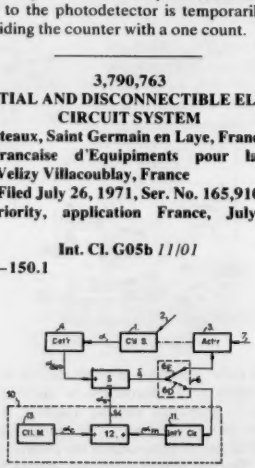
An apparatus and method for counting repetitive patterns in strips of moving apertured material in which the material is passed between a light source and photodetector positioned respectively on an opposing pair of aligning body members, the photodetector in turn being electrically connected to a counter located externally of the body members. A representation member substantially identical to one of the patterns to be counted is also positioned between the light source and photodetector and as the strip of material passes over and mates with the representation in a predetermined manner, the flow of light to the photodetector is temporarily suspended, thereby providing the counter with a one count.

3,790,763

DIFFERENTIAL AND DISCONNECTIBLE ELECTRONIC CIRCUIT SYSTEM

Guy C. Willoteaux, Saint Germain en Laye, France, assignor to Societe Francaise d'Equipiments pour la Navigation Aerienne, Velizy Villacoublay, France

Filed July 26, 1971, Ser. No. 165,910
Claims priority, application France, July 27, 1970, 70.27637
Int. Cl. G05b *11/01*
U.S. Cl. 235—150.1 **11 Claims**



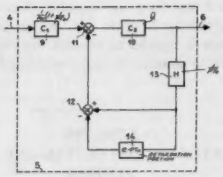
A disconnectible electronic control system which automatically assumes zero during disconnection and which at the instant of re-connection gives a zero value signal. In connection with a controlled system, a detector provides a signal depending on the controlled parameter in the controlled system. A control command device provides a signal depending on the control command and a comparator receives at a first input the signal coming from the detector and at a second input the signal coming from the said control command device. An actuator acts on the controlled parameter. A secondary control loop is formed whose output signal can modify the signal coming from the said control command device. A switch is used with two positions, namely a connected position in which the output signal from the comparator is applied to the actuator to form a main control loop and a disconnected position where the output signal of the comparator is fed to the input of the secondary control loop.

3,790,764

TIME DELAY COMPENSATION IN A CLOSED LOOP PROCESS CONTROL SYSTEM

Roland Rouxel, Seyssinet, and Gabriel Chevalier, Grenoble, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques, Paris, France

Division of Ser. No. 16,212, March 3, 1970, Pat. No. 3,644,719. This application Dec. 23, 1971, Ser. No. 211,803
Claims priority, application France, Mar. 3, 1969, 69.05752
Int. Cl. G05b *6/02*
U.S. Cl. 235—150.1 **2 Claims**



The deleterious effect of time lag in an industrial process on the operation of a closed loop feedback control system in which such process is regulated may be substantially eliminated without sacrificing static accuracy of the system by a specially designed process controller. The controller includes first and second networks connected in tandem in the main path of the feedback loop through one input of a first subtracter. The controller output is coupled to one input of a second subtracter through a third network whose transfer function is equal to the product of the first network transfer function and the equivalent unretarded transfer function of the controlled process. The output of the third network is also coupled to the other input of the second substracter through a retardation circuit having the same delay characteristics as that of the process. The output of the second subtracter is connected to the second input of the first subtracter to provide the required process control signal at the output of the second network.

3,790,765

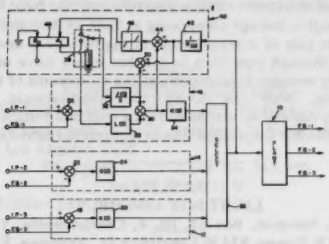
GOVERNOR WITH INTEGRATOR RESET

Terry Morrison, Elmwood, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Feb. 1, 1973, Ser. No. 328,864
Int. Cl. F02c *9/08*
U.S. Cl. 235—150.1 **9 Claims**

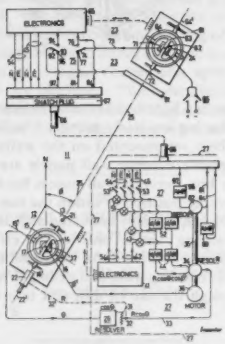
A control system employing, in one of a plurality of control loops, an isochronous governor and means for controlling the output of the integrator of the governor as a function of the control signal selected by the system logic. During closed loop

control under command of the isochronous governor the integrator operates normally whereas during isochronous gover-



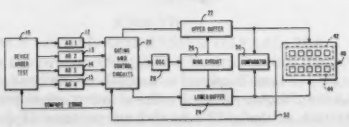
nor open loop operation the integrator is operated closed loop on the selected control system output.

3,790,766
INERTIAL NAVIGATION SYSTEMS
Kenneth Robson Brown, Midlothian, Scotland, assignor to Ferranti Limited, Hollinwood, Lancashire, England
Filed Mar. 5, 1971, Ser. No. 121,604
Int. Cl. G06f *15/50*
U.S. Cl. 235—150.25 **8 Claims**



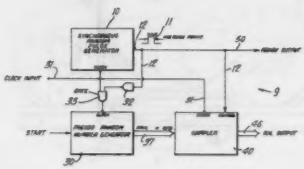
Apparatus for quickly levelling and orientating the inertial navigation platforms of shipborne fighter aircraft prior to take-off including a shipborne reference inertial platform common to all the aircraft and stabilised against the ship's pitch, roll and yaw, together with a computer system for slaving to that reference platform the platform of each aircraft in turn.

3,790,767
PULSE ANALYZING TESTER
Arthur Duane Alexander, 4412 Embleton Dr., Raleigh, N.C.
Continuation of Ser. No. 88,298, Nov. 10, 1970. This application Dec. 4, 1972, Ser. No. 311,584
Int. Cl. G01r *19/16*
U.S. Cl. 235—151.31 **51 Claims**



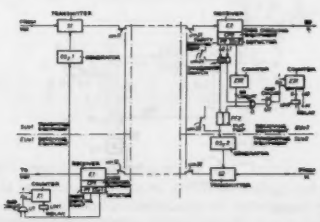
A test instrument is provided for performing analysis and control functions. Analogue input signals in excess of a clipping level are converted to digital signals which are sampled at numerous points in real time in order to provide a digital pattern representative of the sampled signal. The digital pattern is stored for subsequent analysis, and the stored pattern is displayed in digital form for visual analysis by an operator. Repetitive signals can be analyzed by the test instrument for the purpose of measuring pulse parameters such as amplitude, width, pulse shape, pulse separation, and the like. Controls are included for stopping the test instrument and signaling the device under test in response to any one of several conditions which may be selected. The test instrument includes equipment for detecting and storing signals which deviate from a reference pattern. When a deviation is detected, the test instrument may be stopped in which event the device under test is signaled, and the pattern of the deviation signal is displayed.

3,790,768
RANDOM NUMBER GENERATOR
Paul Chevalier; Claude Menard, both of Montreal, and Bertrand Dorval, Quebec, all of Canada, assignors to Prayfel Inc., Montreal, Quebec, Canada
Filed Sept. 28, 1972, Ser. No. 292,861
Int. Cl. G06f *7/00*
U.S. Cl. 235—152 **12 Claims**



A method of generating random numbers which comprises sampling, in a random manner, a pseudo-random generator. The random number generator comprises a pseudo-random number generator for generating pseudo-random numbers, a synchronous random pulse generator for generating synchronous random pulses and sampling means for sampling a pseudo-random number, the sampling being done at each instance one of the synchronous random pulses is generated, whereby to generate an output random number.

3,790,769
SYSTEM FOR FAULT DETECTION AND LOCATION ON DATA LINES
Reinhold Ziegler, Stuttgart-Munster, Germany, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Nov. 21, 1972, Ser. No. 308,378
Claims priority, application Germany, Dec. 1, 1971, P 21 59 675.8
Int. Cl. G06f *11/04*
U.S. Cl. 235—153 AK **16 Claims**



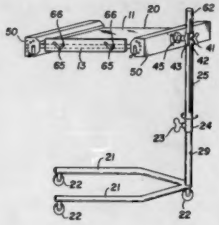
Whenever faults or errors are detected in the receive data signal at one station of a data link, a predetermined signal

requesting transmission of a special signal is transmitted to the other station of the data link. If the special signal is not correctly received at the one station, a changeover occurs and the transmitter and receiver within each station are interconnected. Check signals are transmitted and from the results it can be determined whether the fault is due to bit errors, a faulty transmitter and/or a faulty receiver of either or both of the stations or a faulty line interconnecting the stations.

ERRATUM

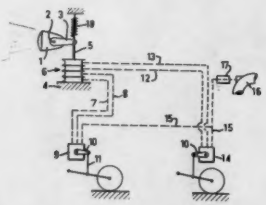
For Class 235—151.3 see:
Patent No. 3,790,910

3,790,770
ILLUMINATED BOOK SUPPORT
Eric P. Stern, Casilla 2662, Quito, Ecuador
Filed Nov. 20, 1972, Ser. No. 308,234
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 P **8 Claims**



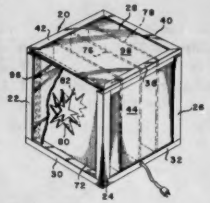
An adjustable support apparatus to hold books or other reading matter in position so as to enable lying or seated individuals to read. The apparatus consists of a transparent plate, preferably of acrylic plastic, which is supported by an adjustable arm attached either to the bed head board or to a portable stand. Shielded tubular light bulbs on each side of the transparent plate may be rotated so as to cast light from either below the plate, or to a position above the plate so that the reading matter may be illuminated for reading from below, or from above the support level.

3,790,771
DIP CORRECTORS FOR HEADLAMPS OF VEHICLES
Michel Tixier, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France
Filed Jan. 10, 1972, Ser. No. 216,583
Claims priority, application France, Jan. 19, 1971, 71.01627
Int. Cl. B60g *1/10*
U.S. Cl. 240—7.1 LJ **1 Claim**



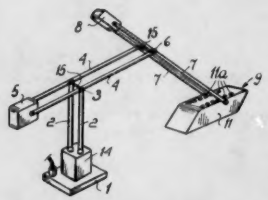
A vehicle headlamp is pivotally mounted and rigid with an arm connected to the vehicle body through a link and a deformable bellows comprising a plurality of pairs of compartments in which one pair is connected through corresponding pipe lines to a rotary valve. The rotation of the movable member of the rotary valve is controlled by the front suspension through a linkage comprising at least an arm and a link. The other pair of compartments of the bellows is connected likewise through pipe lines to another rotary valve of which the rotary member is responsive to the movements of the rear suspension. With this device, the misadjustment of the headlamp dip due to variations in the trim of a vehicle having a rather flexible suspension system is corrected automatically.

3,790,772
LIGHT BOX ASSEMBLY
Peter M. Newman, Box 61, Rt. 4, Charlottesville, Va., and Daniel P. Rowan, 934 N. Longfellow St., Arlington, Va.
Filed May 18, 1972, Ser. No. 254,490
Int. Cl. F21p *1/02*
U.S. Cl. 240—10 R **18 Claims**



This invention is a light box assembly which includes a box-like structure having interiorly mirrored walls. Multiple illuminating members are mounted on the walls within the box and interchangeable exterior wall panels are removably engaged with the box. Interior wall panels having cut-out portions are removably positioned within the box. The illuminating members are sequentially activated and deactivated and a constantly changing visual and color effect is thereby produced within the box itself, on the surface of the box and projected on surrounding walls and ceiling. Various effects are obtainable through the use of different interior and exterior wall panels.

3,790,773
LAMP WITH AN ARTICULATED SUPPORT
Richard Sapper, Loewenstrasse 96-7, Stuttgart, Germany
Filed Oct. 4, 1971, Ser. No. 188,709
Int. Cl. F21v *21/26*
U.S. Cl. 240—81 BD **1 Claim**



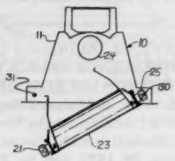
A lamp with an articulated support comprising a stem and a plurality of arms disposed in succession and connected in an articulated manner to each other at intermediate points. A terminal one of the arms remote from the stem supports at the one end a lamp holder and its relative accessories and at the other end a counter weight is arranged in such a manner as to balance the terminal arm and the components supported by it. Each other arm has one end connected in an articulated

manner to the next arm in the direction of the terminal arm, and its other end supports a counterweight arranged in such a manner as to balance the said other arm with all the components supported by it.

3,790,774
FLUORESCENT LUMINAIRE

Jack V. Miller, Sierra Madre, and Rudolph D. Galindo, Buena Park, both of Calif., assignors to Sunbeam Lighting Co., Los Angeles, Calif.

Filed June 23, 1972, Ser. No. 265,949
Int. Cl. F21v *21/30*
U.S. Cl. 240—147 **2 Claims**



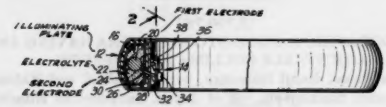
Disclosed is an improved ceiling fluorescent luminaire employing a recessed hinged door which supports not only a diffuser or a louver for light control, but the parabolic section reflector as well. The reflector is effective to enhance light output and does not interfere with relamping of the luminaire.

The door is openable from either side and totally removable through the use of integral corner clip spring catch hinge members which are disclosed. The light distribution characteristics of the luminaire may be changed simply by removal and replacement of the diffuser or louver in combination with the reflector.

3,790,775
BODY ORNAMENT WITH ELECTROLUMINESCENT PORTION

Richard D. Rosenblatt, 4941 Arlington Ave., Riverdale, N.Y.

Filed Nov. 19, 1971, Ser. No. 200,312
Int. Cl. A44c *5/00*
U.S. Cl. 240—2.25 **3 Claims**



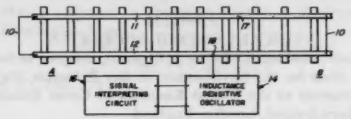
An ornament which may be worn on the neck, arm, waist, etc., and which employs light which may be electroluminescent, incandescent, or fluorescent. The ornament itself is constructed out of battery material which provides the electrical power for illumination; the surface of the ornament is provided with light sources or light emitting devices and connections are provided for energizing the sources. In an alternative embodiment the light sources are internal to the ornament and fiber optics guide the light from the source to the ornaments outer surface.

3,790,776
TRACK SIGNAL RESPONSIVE TO VARIABLE FREQUENCY

Wendell G. Rawlins, 913 Croix St., Topeka, Kans.

Continuation-in-part of Ser. No. 845,195, July 28, 1969, abandoned. This application July 13, 1971, Ser. No. 162,201
Int. Cl. B61l *1/02*
U.S. Cl. 246—40 **14 Claims**

A system providing a signal of an approaching train wherein an inductive loop formed by the railway tracks on which the train rolls serves to change the frequency of an oscillator when a railway vehicle enters the inductive loop thereby changing

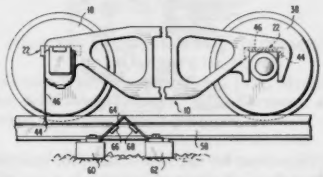


its inductance. A circuit serves to detect the change in frequency and provides a signal of the approach of a railway vehicle.

3,790,777
INDICATOR FOR OVERHEATED BEARINGS

William M. Pelino, Richmond, Va., assignor to Railtron Corporation, Richmond, Pa.

Filed May 26, 1972, Ser. No. 257,292
Int. Cl. B61k *9/00*
U.S. Cl. 246—169 A **22 Claims**

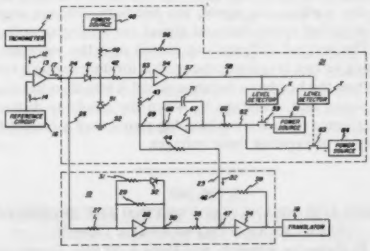


An indicator for overheated vehicle bearings including means for releasing a tethered weight at a predetermined bearing temperature, the depending weight providing an alarm indication visually and both audibly and electrically in combination with associated strike plates and electromechanical transducers.

3,790,778
DYNAMIC BIASING ARRANGEMENT FOR SPEED REGULATION

Lloyd Robert Oster, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Dec. 13, 1972, Ser. No. 314,742
Int. Cl. B60l *15/20*
U.S. Cl. 246—182 C **7 Claims**



A speed regulator arrangement for traction vehicles wherein, in response to velocity error, motoring and braking functions are modulated in comparatively infrequent cycles to monitor vehicle speed within comparatively narrow tolerance limits. A low gain amplification of the velocity error is obtained when the amplitude thereof lies within a predetermined band of operation and a higher gain characteristic is obtained

when the amplitude thereof lies outside the predetermined band of operation.

3,790,779

VEHICLE CONTROL APPARATUS

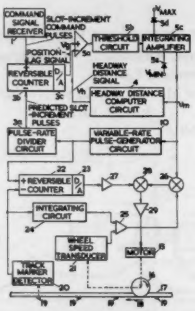
Denys Ian Paddison, Godalming, England, assignor to Secretary of State for the Environment in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 5, 1971, Ser. No. 186,754

Claims priority, application Great Britain, Oct. 6, 1970, 47433/70

Int. Cl. B60l *15/40*

U.S. Cl. 246—182 C **12 Claims**



Control apparatus for use in a vehicle, for controlling the vehicle throughout all stages of journeys in a versatile transport system wherein individual vehicles without drivers may be directed independently to different destinations over a network of predetermined paths or tracks. The apparatus includes a command signal receiver, means for deriving progress signals and a rate-of-progress signal, a first differencing circuit for deriving a position-lag signal dependent on the difference between a count of the command signals and a count of the progress signals, a computer circuit for deriving a headway-distance signal dependent on the rate-of-progress signal, a second differencing circuit for deriving a control signal dependent on the difference between the position-lag signal and the headway-distance signal, an integrating and limiting circuit for deriving a modified speed-demand signal dependent on the control signal, and a speed-control system for controlling the speed of the vehicle according to the value of the modified speed-demand signal. The command signals and the progress signals are pulses each representing increments of distance, whereas the position-lag signal, the headway-distance signal and the modified speed-demand signal are analogue voltage signals. The second differencing circuit and the integrating and limiting circuit may comprise means for developing a voltage V_1 when the headway-distance signal is less than the position-lag signal and a voltage V_2 when the headway-distance signal is greater than the position-lag signal, and a circuit for cumulatively integrating these voltages.

3,790,780

METHOD AND MEANS FOR VARYING THE SPEEDS OF VEHICLES MOVING ALONG A TRACK

Conrad D. Helmcke, Munich, and Hans J. Wendt, Buxtehude, both of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

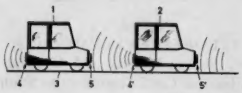
Filed Mar. 14, 1972, Ser. No. 234,604

Claims priority, application Germany, Mar. 26, 1971, P 21 14 621.4

Int. Cl. B60l *15/20*

U.S. Cl. 246—187 C **20 Claims**

In the disclosed method and system, vehicles travelling along a track in single file transmit signals to the following vehicles and receive signals from the preceding vehicles. The information content of the transmitted signals varies with the speed of the transmitting vehicle. The information content of



the received signals is also modulated by the speed of the receiving vehicle. The speed of the receiving vehicle is varied in dependence upon the signals received.

3,790,781

CATHODOLUMINESCENCE DEVICE FOR SCANNING ELECTRON MICROSCOPES

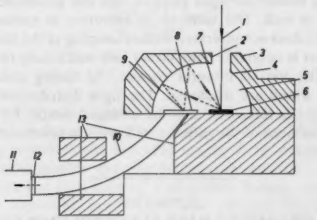
Erwin Horl; Peter Scholze, and Eduard Mugschl, all of Vienna, Austria, assignors to Oesterreichische Studiengesellschaft fur Atomenergie Gesellschaft m.b.H., Vienna, Austria

Filed Sept. 28, 1972, Ser. No. 292,954

Claims priority, application Austria, Oct. 5, 1971, 8603/71

Int. Cl. H01j *37/26*

U.S. Cl. 250—310 **6 Claims**



A cathodoluminescence device for scanning electron microscopes which comprises a hollow space for arranging a specimen therein, and said hollow space having at least one focus and provided with a reflecting cover.

3,790.782

TOPOGRAPHIC RADIOISOTOPE CAMERA HAVING AN ADJUSTABLE COLLIMATOR THEREON

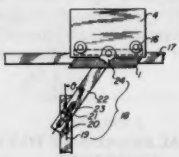
Minoru Inoue; Kenji Ishimatsu, both of Tokyo, and Hideho Tabuchi, Hachioji-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1969, Ser. No. 809,138

Claims priority, application Japan, Mar. 25, 1968, 43/18920

Int. Cl. G01n *23/00*; **H01j** *37/00*

U.S. Cl. 250—61.5 **7 Claims**

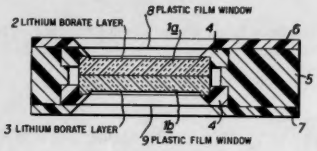


A radioisotope camera adapted to detect radioisotopes on a particular tomographical plane exclusively with high accuracy and high resolution, comprising a multi-hole parallel collimator formed into a special form and a gamma ray detector coupled to the collimator to be movable with respect to the tomographical plane.

3,790,783
RADIATION DOSEMETERS OF THE THERMOLUMINESCENT TYPE

Robert Thompson Brunskill, Holmrock, and Walter Alfred Langmead, Wantage, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Sept. 20, 1971, Ser. No. 181,808
Claims priority, application Great Britain, Nov. 6, 1970, 52,980/70
Int. Cl. G01t 1/11
U.S. Cl. 250—362 2 Claims

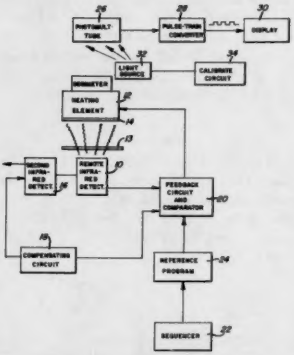


A radiation dosemeter comprising thermoluminescent powder mounted on a base of graphite or other material which can be heated by radiofrequency.

3,790,784
METHOD AND APPARATUS FOR TREATING THERMOLUMINESCENT DOSIMETERS DURING READ-OUT TO ENABLE THEIR IMMEDIATE REUSE

Geoffrey A. M. Webb, Wantage, England, and Howard P. Phykitt, Hillsdale, N.J., assignors to Isotopes, Incorporated, Westwood, N.J.

Filed June 6, 1972, Ser. No. 260,330
Int. Cl. G01t 1/11
U.S. Cl. 250—362 23 Claims

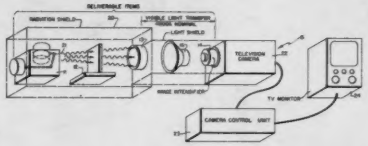


A method and apparatus for treating thermoluminescent dosimeters to enable read-out of the dosimeters and to permit their prompt reuse by eliminating the conventional annealing cycle. The dosimeter is initially preheated to a first temperature and is maintained at that temperature for a predetermined time. The dosimeter is then heated to a second read-out temperature and is maintained at the read-out temperature for a selected time interval. The dosimeter is then immediately heated further to an annealing temperature which is maintained for a selected interval, followed by cooling of the dosimeter whereby the dosimeter can again be promptly reused for accurately determining radiation dosage without the necessity of subjecting the dosimeter to the conventional and lengthy annealing cycle.

3,790,785
RADIOGRAPHIC IMAGING

Frank Paolini, Stamford, Conn., and Alfred Kuhnel, Stow, Mass., assignors to American Science & Engineering, Inc., Cambridge, Mass.

Filed Nov. 18, 1971, Ser. No. 199,881
Int. Cl. G01t 39/18
U.S. Cl. 250—71.5 R 10 Claims

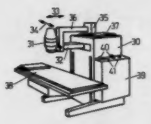


An X-ray imaging system includes a thin sodium iodide single crystal or matrix of single crystals for converting an X-ray image into a visible image. Preferably an electro-optical amplifier amplifies the detected image and delivers the amplified image to a closed circuit television viewing system.

3,790,786
PROCESS AND DEVICE FOR DETERMINING RADIOACTIVE ISOTOPES

Hanns-Immo Friel, Erlangen; Rudolf Prag, Marloffstein, and Heidi Schlichting, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Mar. 8, 1972, Ser. No. 232,868
Claims priority, application Germany, Apr. 10, 1971, P 21 17 698.7
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 S 5 Claims



Process and device for ray diagnosis are used to determine the distribution of radioactive isotopes located in a body by a line by line feeling of a measured surface through which the rays pass. The feeling takes place by means of a measuring probe which changes the intensity distribution into a sequence of impulses which are summed up one after the other through adjustable partial lengths of image rows in an integration counter combined with an inscribing device operated by the sums of impulses to provide an image reproducing the intensity distribution. The invention is particularly characterized in that the sums of impulses are fed to corresponding sections of storing elements and are transmitted for operating the inscribing device at the earliest during the feeling of the next image line.

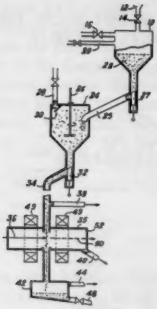
3,790,787
METHOD AND DEVICE FOR PRODUCING BY CHARGE-TRANSFER A BEAM OF NEUTRAL PARTICLES OR OF IONS HAVING MULTIPLE CHARGES

Richard Geller, Grenoble, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Apr. 4, 1972, Ser. No. 240,947
Int. Cl. H01j 35/00
U.S. Cl. 250—251 8 Claims

A method and device for the production of a beam of neutral particles or of heavy ions charged a plurality of times in which electric charges are neutralized or transferred between the charged particles of an incident beam and a sub-

stance traversed by the beam. A substantially homogeneous stream of powder consisting of grains having a diameter of the order of 100 A is caused to pass through the incident beam of



charged particles in order to form a target which is traversed by said beam, the rate of circulation being such that each charged particle should meet either one grain or at least a plurality of atoms of one grain.

3,790,788

LINE-FOLLOWER

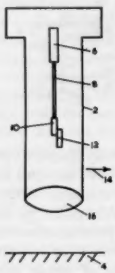
Paul Frank Lister, Birmingham, England, assignor to The British Oxygen Company Limited, London, England

Filed Nov. 3, 1971, Ser. No. 195,333

Claims priority, application Great Britain, Nov. 5, 1970, 52,746/70

Int. Cl. G05b *1/00*

U.S. Cl. 250—202 **1 Claim**



A line-follower including two photoelectric cells able to be oscillated in unison transversely to the axis of the line being followed. One cell is arranged to produce a steering signal and the other an error-displacement signal.

3,790,789

CIRCUIT FOR CONTROLLING EXPOSURE

Isao Takahashi, and Tsutomu Kimura, both of 210 Minami, Ashigara-shi, Kanagawa, Japan

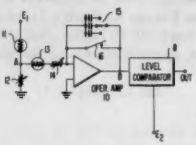
Filed Sept. 22, 1972, Ser. No. 291,481

Claims priority, application Japan, Sept. 22, 1971, 46/74031

Int. Cl. G03b *27/74, 27/78*

U.S. Cl. 250—209 **2 Claims**

A circuit for controlling exposure which has a Miller integrator for integrating a photocurrent from a photoelectric converting light acceptor, a circuit for generating a predetermined set level, and a level comparator for generating an exposure finishing signal when the output of the integrator arrives at the predetermined level set by the level generating circuit. Thus, a great deal of electric current can be obtained without using a photoelectric tube or thyratron. A low impedance circuit may be used which is not affected by leaking current or dark current so as not to deteriorate the elements and thereby improve circuit reliability.



3,790,790

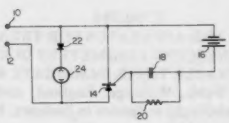
POLARITY SENSITIVE ELECTRONIC SWITCH AND POLARITY INDICATOR

William L. Norman, Sylmar, Calif., assignor to Norman Enterprises, Inc., Burbank, Calif.

Filed May 19, 1972, Ser. No. 255,141

Int. Cl. H01j *39/12*

U.S. Cl. 250—211 J **1 Claim**



A solid state switch for performing a control operation which is operated by a voltage of a particular polarity and a diode and indicating means connected in series across the switch. The diode and indicating means are connected in series across the switch so that current flows through the diode and the indicating means in response to the application of a voltage of incorrect polarity to the switch means. Flow of current through the indicating means causes it to signal the application of a voltage of incorrect polarity.

3,790,791

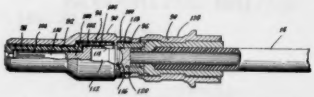
OPTOELECTRONIC CABLE ASSEMBLY

Norman Richard Anderson, Cicero, Ill., assignor to Bunker Ramo Corporation, Oak Brooks, Ill.

Filed July 20, 1972, Ser. No. 273,527

Int. Cl. G02b *5/16*

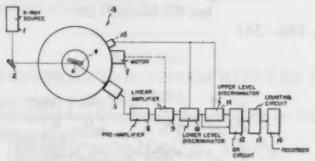
U.S. Cl. 250—227 **15 Claims**



This invention relates to an optoelectronic cable assembly which utilizes standard connector elements as part of the termination assemblies. Mounted in each termination assembly are a plurality of termination elements each of which is adapted to have a fiber optic light conducting cable secured therein. An active optoelectronic device is mounted in a suitable mounting means in each of the termination elements and contact means are attached at one end through the mounting means to make electrical contact with the active device. The contacts project at the other end for connection to external elements. The mounting means is supported by a suitable

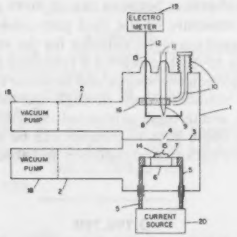
means in the bore of the element body. A lens or other suitable device is mounted in front of the device for transmitting light between the device and the cable. The assembly design, particularly that for the termination assembly containing a light emitting device, is specially designed for dissipating heat from the device.

3,790,792
DEVICE FOR X-RAY ANALYSIS
Hiroshi Ishijima, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 30, 1972, Ser. No. 285,059
Int. Cl. G01n *23/20*
U.S. Cl. 250—278 **5 Claims**



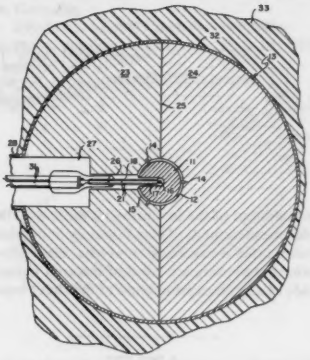
This specification discloses a device for X-ray analysis having a pulse height analyzer in which the window width of the analyzer is varied in proportion to $\sqrt{\sin\theta}$ in order to discriminate pulses attributable to the X-rays satisfying the Bragg equation.

3,790,793
MOLECULAR SCANNER
John G. King, Brookline, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation of Ser. No. 56,056, June 25, 1970, abandoned, which is a continuation of Ser. No. 713,969, March 18, 1968, abandoned. This application Nov. 5, 1971, Ser. No. 196,236
Int. Cl. G01n *27/78*; **H01s** *1/00*
U.S. Cl. 250—251 **19 Claims**



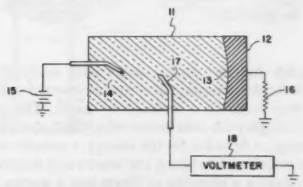
A device and method in which neutral atoms or molecules are used to observe surfaces of samples and capable in particular of producing information from inhomogeneous samples where the forces and interactions are of strength characterized by moderate temperatures in the range of 100°K to 500°K. Molecules evaporating from the surface of a sample are shown selected by a pin-hole and detected and converted to an ion current by a surface ionizing detector. With relative scanning movement of components of the system, the ion current is monitored and recorded, indicating the spatial variation in evaporation of the molecules from the sample.

3,790,794
ABSOLUTE CALORIMETRIC DOSIMETER
Kenneth M. Murray, Alexandria, Va., and Frank H. Attix, Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 21, 1972, Ser. No. 317,322
Int. Cl. G01t *1/12*
U.S. Cl. 250—352 **7 Claims**



A device for determining radiation dose by measuring a change of temperature in a material due to incident radiation on the material.

3,790,795
HIGH FIELD CDS DETECTOR FOR INFRARED RADIATION
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Ramesh C. Tyagi, Delhi, India; James B. Robertson, Yorktown, Va.; Karl W. Boer, Kennett Square, Pa., and Henry C. Hadley, Jr., Newark, Del.
Filed July 26, 1972, Ser. No. 275,118
Int. Cl. G01j *1/02*
U.S. Cl. 250—338 **6 Claims**



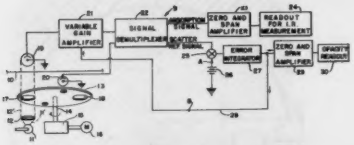
An infrared radiation detector including a cadmium sulfide (CdS) platelet having a cathode formed on one of its ends and an anode formed on its other end. The platelet is suitably doped such that stationary high-field domains are formed adjacent the cathode when biased in the negative differential conductivity region. A negative potential is applied to the cathode such that a high-field domain is formed adjacent to the cathode. A potential measuring probe is located between the cathode and the anode at the edge of the high-field domain and means are provided for measuring the potential at the probe whereby this measurement is indicative of the infrared radiation striking the platelet.

3,790,796

METHOD AND APPARATUS FOR MEASUREMENT OF SHEET OPACITY

Donald C. Brunton, and Carl R. Soltesz, both of Columbus, Ohio, assignors to Infra Systems, Inc.

Division of Ser. No. 114,520, Feb. 11, 1971, abandoned. This application June 5, 1972, Ser. No. 260,017
Int. Cl. G01j *3/00*
U.S. Cl. 250—339 **9 Claims**



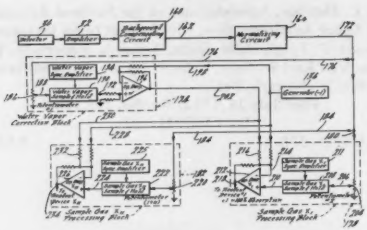
An embodiment of the invention includes a method and apparatus for measurement of sheet opacity in combination with any optical ratio measurement of the same sheet such as weight wherein a reference band of infrared radiations which lies outside of any absorption band of the sheet material is utilized.

3,790,797

METHOD AND SYSTEM FOR THE INFRARED ANALYSIS OF GASES

Stanley R. Sternberg, 5591 Textile, Ypsilanti, Mich.; James E. Young, 5282 Grayton, Detroit, Mich., and John W. Lennington, 1018 Congress, Ypsilanti, Mich.

Continuation-in-part of Ser. No. 809,752, March 24, 1969, abandoned. This application Sept. 7, 1971, Ser. No. 178,260
Int. Cl. G01n *21/26*
U.S. Cl. 250—345 **37 Claims**



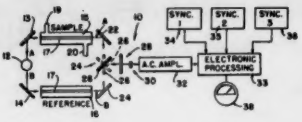
A dual path analyzer and a single path analyzer are disclosed, each for determining the concentration of one or more gaseous components in a mixture of gases. The preferred analyzer is a single path instrument which includes a source of infrared energy, a detector for the energy, a sample cell for the gas mixture positioned between the source and detector, and a filter wheel having a plurality of filters and a source blocking device positioned between the sample cell and detector for sequentially interposing the filters and the source blocking device between the source and the detector. Means are provided for amplifying the output signal of the detector and for processing the signal to provide a direct readout display which indicates the concentration of the gaseous components being analyzed. The processing electronics preferably include provision for calibrating the analyzer with clean ambient air, for compensating for background levels of radiation, and for correcting the displayed output signal for the effects of absorption band interferences between two or more gases in the gas mixture. The structure of the dual path analyzer includes a source of infrared energy, a detector for the energy, a sample cell for the gas mixture, a cell for a reference gas, and optical path means between the source and detector for sequentially directing the source energy through the sample cell, the reference cell, and through neither cell. Processing electronics similar to the single path instrument can be incorporated to compensate for background radiation and absorption band interferences.

3,790,798

METHOD AND SYSTEM FOR THE INFRARED ANALYSIS OF GASES

Stanley R. Sternberg, Ypsilanti; James E. Young, Detroit, and John W. Lennington, Ypsilanti, all of Mich., assignors to Metro Hydraulics, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 178,260, Sept. 7, 1971, which is a continuation-in-part of Ser. No. 809,752, Mar. 24, 1969, abandoned.
Filed Aug. 18, 1972, Ser. No. 281,958
Int. Cl. G01n *21/26*
U.S. Cl. 250—345 **36 Claims**



A dual path analyzer and a single path analyzer are disclosed, each for determining the concentration of one or more gaseous components in a mixture of gases. The preferred analyzer is a single path instrument which includes a source of infrared energy, a detector for the energy, a sample cell for the gas mixture positioned between the source and detector, and a filter wheel having a plurality of filters and a source blocking device positioned between the sample cell and detector for sequentially interposing the filters and the source blocking device between the source and the detector. Means are provided for amplifying the output signal of the detector and for processing the signal to provide a direct readout display which indicates the concentration of the gaseous components being analyzed. The processing electronics preferably include provision for calibrating the analyzer with clean ambient air, for compensating for background levels of radiation, and for correcting the displayed output signal for the effects of absorption band interferences between two or more gases in the gas mixture. The structure of the dual path analyzer includes a source of infrared energy, a detector for the energy, a sample cell for the gas mixture, a cell for a reference gas, and optical path means between the source and detector for sequentially directing the source energy through the sample cell, the reference cell, and through neither cell. Processing electronics similar to the single path instrument can be incorporated to compensate for background radiation and absorption band interferences.

3,790,799

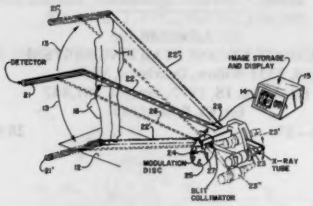
RADIANT ENERGY IMAGING WITH ROCKING SCANNING

Jay A. Stein, Framingham, and Gerald Polucci, Cambridge, both of Mass., assignors to American Science & Engineering Inc., Cambridge, Mass.

Filed June 21, 1972, Ser. No. 264,857
Int. Cl. G01t *1/20*
U.S. Cl. 250—363 **10 Claims**

A pencil beam of X-rays scans an object along a line of direction along a line X-ray detector to produce an image of the line along a picture tube. The object scanned and the line of scan are relatively displaced by rocking the X-ray source and line detector about an axis substantially passing through a slit which collimates the X-ray energy into a fan beam inter-

cepted by a rotating disc with radial slits that provides the scanning pencil beam. The X-ray detector preferably comprises sodium iodide elements imbedded in a light pipe with a photocell at each end of the light pipe.



3,790,800

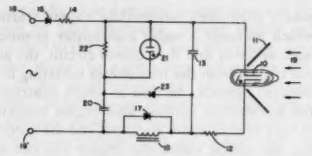
RADIATION DETECTION SYSTEM WITH FAIL SAFE FEATURE

Leslie Richard Linner, Chaffee, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 27, 1972, Ser. No. 318,958

Int. Cl. G01j *5/36*

U.S. Cl. 250—372 **7 Claims**



An internal ionization radiation sensor operates to discharge a capacitor in the presence of incident radiation. The recharging current is sensed by a threshold output device. In one embodiment, the threshold output device is prevented from receiving the additional current necessary to be triggered if the radiation sensor fails in the runaway mode. The additional current to trigger the threshold output device is supplied from a second capacitor which is prevented from charging by a runaway radiation sensor.

3,790,801

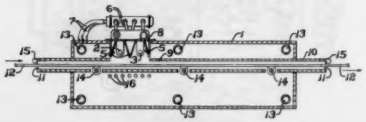
APPARATUS FOR ULTRAVIOLET LIGHT TREATMENT IN A CONTROLLED ATMOSPHERE

George E. Coleman, Elmhurst, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 8, 1972, Ser. No. 287,400. The portion of the term of this patent subsequent to July 11, 1989, has been disclaimed.

Int. Cl. H01j *37/20*

U.S. Cl. 250—453 **11 Claims**



Apparatus which permits treatment of products with ultraviolet light in a controlled atmosphere comprises an inner chamber positioned within an outer chamber, the workpiece to be treated passing through the inner chamber. The outer chamber has a means for supplying ultraviolet light in the upper surface of a second or inner chamber whereby ultraviolet light may be radiated in the inner or second chamber. The apparatus may also contain means for carrying the product to be treated, as well as cooling means at either end of the path of treatment.

3,790,802

X-RAY FILM IDENTIFICATION MEANS

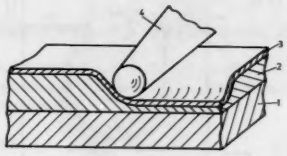
Norbert Mika; Peter H. Grassmann, and Wilhelm Reis, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Oct. 13, 1971, Ser. No. 190,467

Claims priority, application Germany, Oct. 13, 1970, P 20 50 150.2

Int. Cl. G03b *17/26*

U.S. Cl. 250—476 **7 Claims**



A material to identify images produced by X-rays or similar transmitting rays contains a layer absorbing the X-rays and has identifying markings impressed therein. According to the present invention the absorbing layer has indium as its main component.

3,790,803

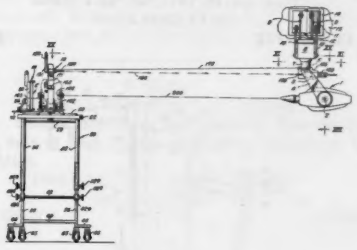
SIGHTING AND RELATING DEVICE FOR X-RAY TUBE HEAD

Willis Paul Phillips, 200 E. Rentz St., Weatherford, Tex.

Filed Oct. 25, 1972, Ser. No. 300,512

Int. Cl. G01n *23/00*

U.S. Cl. 250—490 **10 Claims**

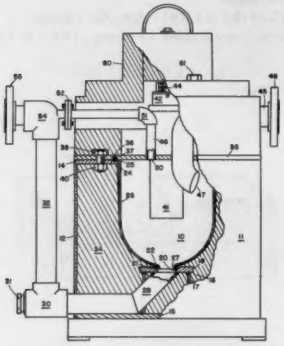


Apparatus to maintain a human head in a fixed position in combination with X-ray film cassette holding means and X-ray tube head sighting means arranged to permit periodic exposure of X-ray film at a prescribed angle and distance. The film holding means comprises a film cassette holder movable arcuately about a reference point positionable to substantially correspond to the center of the dental arc of a patient's mouth, said holder being movable radially relative to the reference point to position film at a prescribed distance and in a prescribed angular relationship to a patient's head. The X-ray tube head sighting apparatus comprises a target positionable in a prescribed angular relationship to a patient's head and a sighting tube secured to the X-ray tube head such that the X-ray film cassette and the X-ray tube head are accurately positionable in prescribed locations on opposite sides of a head.

3,790,804
RADIOACTIVITY MONITORING APPARATUS FOR FLUIDS IN FLOW

David O. Hunt, Bedford, Mass., assignor to Lee Corporation, Waltham, Mass.

Filed May 1, 1972, Ser. No. 249,689
Int. Cl. G01n 23/12
U.S. Cl. 250—506 14 Claims

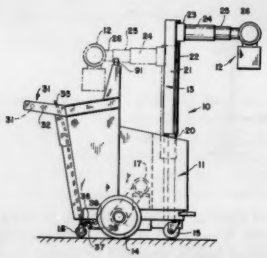


Unusually high sensitivity is obtained in a radioactivity monitor for fluid in flow by blocking external background "noise" with four pi shielding, minimizing residual contamination as a source of internal noise with a dynamic swirl in a removable bowl-shaped container having a smoothly curving surface passing into a bottom outlet, and providing a constant sampling volume by maintaining an external fluid level above that of the container and by venting through the top of the container.

3,790,805
MOBILE X-RAY UNIT

Anthony J. Foderaro, Middleburg Heights, Ohio, assignor to Picker Corporation, Cleveland, Ohio

Filed Apr. 19, 1971, Ser. No. 135,094
Int. Cl. G03b 41/16
U.S. Cl. 250—522 12 Claims

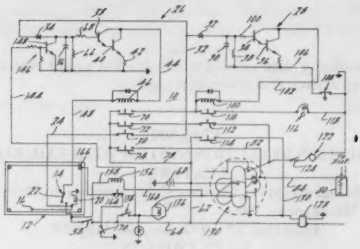


A power driven mobile X-ray unit having greatly improved maneuverability through the provision of an X-ray source nestable for transit and a drive control handle which gives the operator the feel of pushing or pulling the unit during transit. The handle comprises a horizontally disposed gripping bar, movable horizontally forwardly and rearwardly of a neutral position. The handle is biased toward the neutral position where the drive means is deactivated and serves to break the unit from moving. Increased pressure on the handle causes the unit to move at a higher speed. A limit switch is provided to prevent the operation of the power drive at any other than the slowest speed when the X-ray tube is in a position other than its storage position. A novel telescoping mast supports the X-ray tube.

3,790,806
REMOTE ENGINE STARTING SYSTEM

Victor Lessard, 3335 Willow, Dearborn, Mich.

Filed Aug. 18, 1972, Ser. No. 281,847
Int. Cl. B60k 33/00
U.S. Cl. 290—37 28 Claims

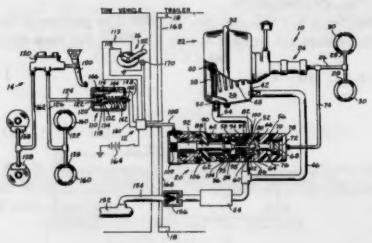


A remotely controlled automobile engine starting control system which includes a radio transmitter remotely located from a radio receiver and the control circuit, the actuation of the control circuit from the transmitter initiating the timing of two preselected periods, the first of which controls the actuation of the automobile ignition and engine cranking systems until such time as the engine is started and the second of which controlling the period which the engine will run after actuation of the radio transmitter. The system further includes various safety features to preclude theft of the automobile as a result of the engine running and a system for initiating the energization of the accessory circuitry to permit energization of, for example, the air conditioning or heating system.

3,790,807
TOW VEHICLE TRAILER BRAKING SYSTEM

Louis P. Rossigno, South Bend, Ind., assignor to The Bendix Corporation

Filed Dec. 22, 1972, Ser. No. 317,859
Int. Cl. B60t 13/60
U.S. Cl. 303—7 12 Claims



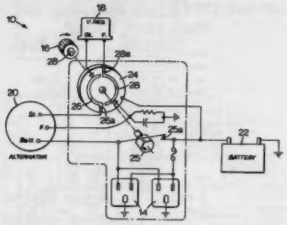
A solenoid operated control valve for establishing an operational pressure differential in a servomotor located in a trailer to activate the wheel brakes of the trailer in response to an operational electrical signal derived from corresponding hydraulic actuation of the wheel brakes of a tow vehicle.

3,790,808

POWER TAKE-OFF SWITCH

Rudolph J. C. Sagl, Clarkson, Canada, assignor to B.E.L.-Tronics Limited, Mississauga, Ontario, Canada

Filed May 2, 1973, Ser. No. 356,509
Int. Cl. H02g 3/00
U.S. Cl. 307—10 R 6 Claims



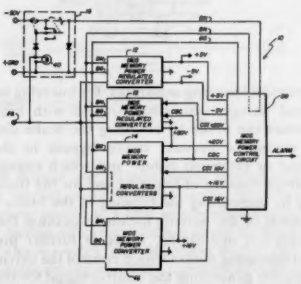
A power take-off and switching device for use in a circuit of an internal combustion engine which includes a source of low voltage direct current, voltage regulator means, alternator means, and conductor means for connecting the source of low voltage current to the alternator by way of the voltage regulator in a conventional manner, said device comprising a normally closed first switch means in the power input circuit of an alternator, normally closed second switch means in the power output circuit of said alternator, power output receptacle means connected to the output of said alternator, supplementary conductor means for connecting said source of low voltage directly to the power input side of said alternator, normally open third switch means in said supplementary conductor means, actuator means for sequentially opening said first switch means to deactivate said alternator and thereafter opening said second switch means to disconnect the power output of the alternator from the low voltage source when the alternator is deactivated and thereafter closing said third switch means to supply low voltage power directly to said alternator such that when the alternator is driven a high voltage is supplied to said power output receptacle.

3,790,809

MOS MEMORY POWER SUPPLY

Karl H. Kuster, Glendale Hgts., Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 25, 1972, Ser. No. 292,023
Int. Cl. H02h 3/00
U.S. Cl. 307—41 3 Claims



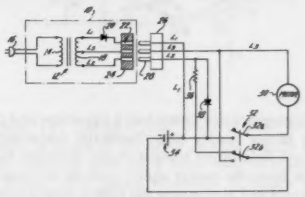
An MOS memory power supply system including voltage monitoring and sequencing circuits to properly control voltage levels during turn-on, turn-off and fault detection. A first voltage monitoring circuit for measuring the 16 volt output of a regulated power supply, a second voltage monitoring circuit for measuring the 20 volt output of a regulated power supply, the monitor circuits including means for detecting a deviation of the respective output voltage levels from a predetermined range and providing a fault signal, a ramp signal generator providing a signal starting from approximately zero and continuously increasing in level whenever a fault is detected, respective crowbar circuits for the 16 volt and 20 volt output terminals, the 16 volt and 20 volt crowbar circuits including respective means for shorting the output levels at different ramp signal levels, the 16 volt output shorted prior to shorting of the 20 volt output level. An inhibit circuit is also provided for responding to a fault signal from the 20 volt monitor circuit and inhibiting the formation of the 16 volt output level thus insuring that the 20 volt output is always greater than the 16 volt output.

3,790,810

DIRECT CURRENT POWER SUPPLY FOR ELECTRICAL APPLIANCES

Fred A. Rogers, Brooklyn, and David Berend, New York, both of N.Y., assignors to J. Wiss & Sons Co., Newark, N.J.

Filed June 30, 1972, Ser. No. 268,098
Int. Cl. H02j 9/04
U.S. Cl. 307—66 12 Claims



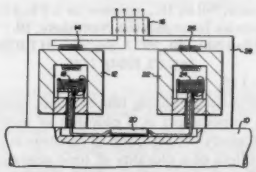
An arrangement in which a center-tapped transformer supplies power for operating a DC motor, as well as charging a battery. Alternating current from the secondary winding of the transformer is rectified through one diode mounted within the transformer unit, and a second diode mounted within the unit carrying the motor. The transformer unit is connected with a three wire plug to the load means, for example, a motor or appliance unit. When the transformer unit is not connected to the applicance unit, the battery operates the motor.

3,790,811

GROUND REFERENCE NETWORK

Phillip V. Cooper, Southfield, and Albert E. Brendel, Lake Orion, both of Mich., assignors to Lebow Associates, Inc., Troy, Mich.

Filed Dec. 7, 1972, Ser. No. 313,143
Int. Cl. G01l 3/00
U.S. Cl. 307—94 8 Claims



An external ground reference network for a transducer system in which the transducer is coupled by transformers to both the input and output of the system. In one embodiment, the external ground reference network has one portion coupled across the input and another portion coupled across the output and is in a star configuration. In another embodiment,

the external ground reference network is a connection between center-taps of the transformers.

3,790,812

DEVICE FOR GENERATING A HIGH VOLTAGE SUPPLY

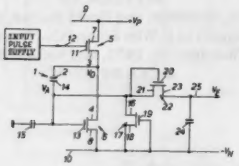
Peter William Fry, Dorchester, England, assignor to Integrated Photomatrix Limited

Filed July 13, 1972, Ser. No. 271,239

Claims priority, application Great Britain, July 26, 1971, 34,982/71

Int. Cl. H02m *3/18;* **H03k** *17/66*

U.S. Cl. 307—110 **7 Claims**



A voltage generator comprises a capacitor and positive and negative power supply rails. Normally non-conducting first and second field-effect transistors are arranged to isolate the capacitor from the power supply rails in the non-conducting state thereof and to connect the power supply rails to respective plates of the capacitor in a conducting state thereof. Means are provided to trigger the first and second transistors into the conducting state for a limited period to charge the capacitor and then isolate the capacitor when the transistors revert to their normal state. A normally non-conducting field-effect transistor is operative, on isolation of the capacitor subsequent to charging thereof, to adopt a conducting state in which such third transistor connects one of the plates of the capacitor to the opposite supply rail to that to which it can be connected by the respective first or second transistor, whereby to produce an enhanced voltage on the other capacitor plate. The enhanced output is delivered across an output capacitor connected via a fourth field-effect transistor to the said other plate of the first mentioned capacitor.

3,790,813

FILM SWITCHING SYSTEM FOR MUTUALLY ISOLATED CIRCUITS

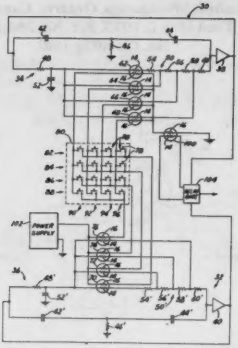
Thomas E. Ennis, Niles, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 30, 1972, Ser. No. 311,026

Int. Cl. H04g *1/45*

U.S. Cl. 307—115 **6 Claims**

A switching system utilizing film switches permits selection of respective impedances in a plurality of mutually isolated circuits, particularly the selection of resistors in the frequency determining filters of a plurality of tone generators in a multifrequency dial signal generator for a telephone set. In one form of the invention, a group of film switches is associated with the frequency determining resistors of each tone generator. The heater element of a film switch from one group is placed in series with the heater element of a film switch from another group and connected to a source of power, as by operation of a single closure push button switch. The temperature-sensitive resistors of the respective film switches thereupon place the corresponding selected resistors in circuit,



whereupon signals of selected predetermined frequencies are produced by the respective tone generators.

3,790,814

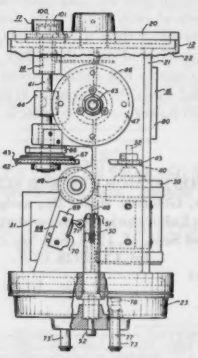
ELECTRICAL LOWERING APPARATUS

Henry C. Pfaff, Jr, Summit, and Wenard Bowser, Jr, Martinsville, both of N.J., assignors to Pfaff & Kendall, Newark, N.J.

Filed June 6, 1972, Ser. No. 260,303

Int. Cl. H01h *35/00*

U.S. Cl. 307—119 **14 Claims**



An electrical lowering apparatus, for lowering and elevating a mounted fixture, which is provided with braking means which secure the brake by coupling the brake directly to the moving means to prevent brake bypass in the event of mechanical or electrical failure and which engage the brake for the initial distance of lowering and for the final distance of elevating by correlating the tripping of the brake limit switch to movement of the moving means to cushion the separation and connection operations, which is further provided with electrical operating means which control the driving means by independently generating the control signal for the power circuit to prevent extraneous electrical interference and which control the braking means by separately operating the brake solenoid and the motor in the power circuit to prevent motor-generated current interference, and which is further provided with overriding means which bypass the driving means by enabling coupling of a shaped portion of the moving means to

an external drive to provide continued operation of the apparatus in the event of electrical or mechanical failure.

3,790,815

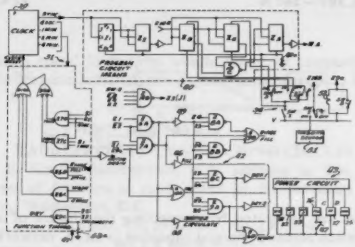
ELECTRONIC CONTROL CIRCUIT FOR APPLIANCES

Joseph Karklys, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 837,163, June 27, 1969, Pat. No. 3,662,186. This application Apr. 4, 1972, Ser. No. 240,966

Int. Cl. H01h *43/00*

U.S. Cl. 307—141 **11 Claims**



A control for a multiple function apparatus, such as an appliance, utilizing an electronic clock, or timer, electronic program circuitry and digital circuitry to select and control the functions to be performed. The electronic program circuitry has a plurality of bistable circuits, one portion controlling a series of steps repeated in each of several subcycles and the other portion controlling the sequence of subcycles. The second portion may be preset to establish a desired operating program. The digital circuitry is responsive to the condition of the bistable program circuits and to the clock to control the operation of the appliance.

3,790,816

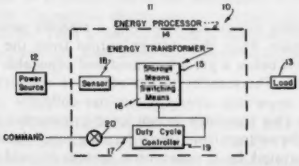
ENERGY STORAGE AND TRANSFER POWER PROCESSOR WITH SELF-CONTAINED PARAMETRIC REGULATING LOOP

Baruch Berman, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 30, 1972, Ser. No. 239,568

Int. Cl. H02j *7/00*

U.S. Cl. 307—149 **7 Claims**



An energy storage and transfer power processor having an inductive or inertial energy transformer for transferring energy from a power source to a load in repetitive energy transfer cycles each having an energy storage phase during which the transformer stores energy from the power source and an energy delivery phase during which the transformer delivers stored energy to the load. The power processor has its own parametric regulating loop for sensing a control parameter which deviates from a steady state value concurrently with deviation of the processor from an equilibrium condition wherein the energy stored in and the energy delivered by the energy transformer during successive transfer cycles remain equal and constant, such that average stored energy level in the storage means remains constant at a steady state level. The regulating loop regulates the transformer duty cycle in response to departure of the control parameter from its steady state value as a result of changes in the processor input and/or output conditions to instantaneously restore the processor to equilibrium. The invention may be utilized in both electrical and mechanical energy transfer systems to maintain a selected system output quantity at a steady state value which may be fixed or varied by command.

3,790,817

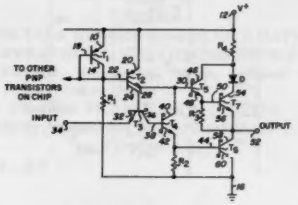
SCHOTTKY CLAMPED TTL CIRCUIT

Robert C. Dobkin, Menlo Park, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 14, 1972, Ser. No. 225,742

Int. Cl. H03k *19/40, 19/08*

U.S. Cl. 307—214 **10 Claims**



A low power TTL gating circuit wherein PNP transistors have been used in place of the usual current source resistors and Schottky-clamped NPN have been used in place of the usual gold doped NPN gating elements to obtain a faster operating circuit which requires less chip area than similar prior art circuits.

3,790,818

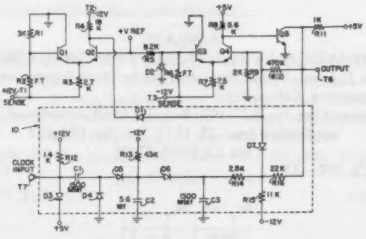
SUPPLY VOLTAGE AND CLOCK SIGNAL MONITOR

Ronald L. Bruckner, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Mar. 26, 1973, Ser. No. 344,826

Int. Cl. H03k *5/00;* **H02h** *3/26*

U.S. Cl. 307—235 R **8 Claims**



In the present disclosure, a first supply voltage is monitored by a first differential amplifier through comparison with a reference potential. Clock pulses are monitored by an R-C diode network. The outputs from the first differential amplifier and the R-C diode network are applied to one input of a second differential amplifier. The other input of the second differential amplifier monitors a second supply voltage, with the output signal of the second differential amplifier being a signal which assumes a first state when the first and second supply voltages are of a proper value and the clock rate is also of a proper value. If either supply voltage or the clock period

is not of a proper value, the output signal assumes a second state.

3,790,819

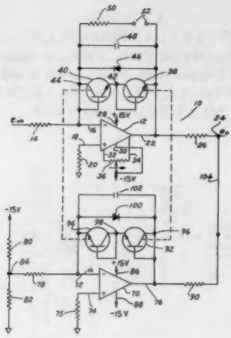
LOG AMPLIFIER APPARATUS

Morteza Chamran, Elmhurst, Ill., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 17, 1972, Ser. No. 235,565

Int. Cl. G06g *7/12, 7/24*

U.S. Cl. 307—229 **8 Claims**



An apparatus for increasing the stabilization of a logarithmic amplifier. In the embodiment disclosed, a first operational amplifier is provided to yield a logarithmic output. A semi-conductor device for providing a first logarithmic transfer characteristic is connected to the first amplifier. In order to prevent variation in the amplifier output resulting from the varying parameters of the semi-conductor device, the second amplifier is provided with the semi-conductor device and connected differentially to the first amplifier. The semi-conductor devices utilizes first and second PN junctions of semi-conductor material mounted in intimate thermal coupling on a single header or alternatively utilizes a monolithic integrated circuit including a substrate of semiconductor material and means on the substrate for providing the logarithmic transfer characteristic for the first amplifier and means on the substrate for providing the logarithmic transfer characteristic for the second amplifier both deposited on the substrate in intimate thermal coupling with each other.

3,790,820

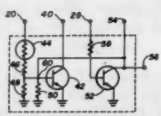
AUTOMATICALLY ADJUSTABLE SWITCHING CIRCUIT

James J. Jones, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 837,497, June 30, 1969, abandoned. This application Sept. 27, 1971, Ser. No. 184,222

Int. Cl. H03k *17/00*

U.S. Cl. 307—237 **4 Claims**



A vehicle skid control braking system including means for generating a signal having a magnitude varying in accordance with braking conditions such as vehicle speed, wheel speed and road surface conditions, circuit means for generating a retarding force signal proportional to such braking control factors and circuit means for generating a ramp signal varying in accordance with vehicle speed, and a speed switch responsive to vehicle wheel speed signals, retarding force signals and velocity ramp signals for producing a speed dependent control signal for controlling the vehicle braking system.

3,790,821

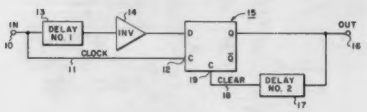
CIRCUIT FOR SUPPRESSION OF SPURIOUS PULSES RESULTING FROM RELAY OPERATION

Gerald P. Adamson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 21, 1972, Ser. No. 282,884

Int. Cl. H03k *3/286, 5/00*

U.S. Cl. 307—247 A **11 Claims**



Pulses are generated by connecting the closure of a reed relay switch across a charged capacitor in an RC network. The pulses are then inverted and coupled into the "CLOCK" input of a "D" type flip-flop circuit.

3,790,822

CIRCUIT ARRANGEMENT FOR THE INTERRUPTION-FREE SWITCH-OVER FROM AN OPERATING CURRENT SUPPLY APPARATUS TO A STANDBY CURRENT SUPPLY APPARATUS

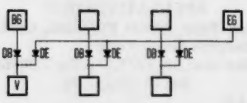
Fritz Giebler, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin und Munich, Germany

Filed Dec. 7, 1970, Ser. No. 95,448

Claims priority, application Germany, Dec. 29, 1969, P 19 65 315.7

Int. Cl. H03k *17/00*

U.S. Cl. 307—254 **3 Claims**



A switching circuit for switching a standby power supply into operation when the voltage output from the operating supply drops below a predetermined and adjustable minimum is described. The standby power supply is connected to the consumer apparatus over the emitter-collector path of a transistor. The transistor is rendered conductive in dependence on the voltage from said operating supply and the error signal generated by a supervision system in said operating supply.

3,790,823

HIGH-SPEED TRANSISTOR DIGITAL GATING

Bruce Edwin Briley, Countryside, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

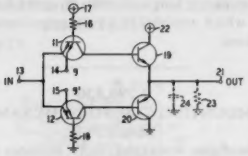
Filed Mar. 3, 1972, Ser. No. 231,658

Int. Cl. H03k *17/00*

U.S. Cl. 307—255 **8 Claims**

A transistor digital gating circuit includes an output stage containing two transistors of opposite conductivity type which are held out of saturation at all times and an input stage containing two multiple-emitter transistors of opposite conduc-

tivity type which are kept in saturation continuously. The gate affords a high degree of isolation when disabled and avoids



switching speed limitations which would be encountered if transistors were switched into and out of saturation.

3,790,824

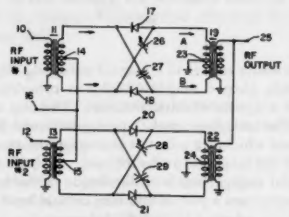
RADIO FREQUENCY SWITCHING CIRCUIT

John E. Krupa, Moorestown, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 10, 1972, Ser. No. 296,456

Int. Cl. H03k *17/00*

U.S. Cl. 307—256 **4 Claims**



A high speed switching circuit wherein the polarity of a control pulse determines which of two discrete RF signals is applied to an output terminal. Each RF signal is coupled through input and output transformer circuits to a common output terminal. A pair of diodes connected between the input and output transformers of one circuit are oppositely biased from similarly connected diodes in the other circuit. The control pulse is fed to a center tap of the secondary of each input transformer. Capacitive shunts are connected between each pair of diodes. Thus a simple switch is obtained having low power requirements, high speed and improved isolation.

3,790,825

GATE-DIFFUSION ISOLATION FOR JFET DEPLETION-MODE BUCKET BRIGADE CIRCUIT

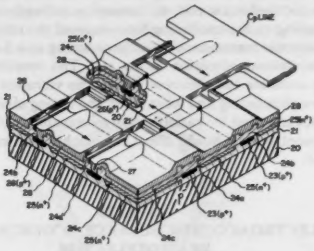
Mark B. Barron, and Walter J. Butler, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1972, Ser. No. 295,872

Int. Cl. H01l *19/00*

U.S. Cl. 307—304 **12 Claims**

Undesired coupling of JFET bucket-brigade stages through the epitaxial layer in a monolithic integrated bucket-brigade circuit is prevented by isolation diffusion regions formed in the epitaxial layer along the two sides of a row of bucket-brigade stages. The isolation diffusion regions are slightly spaced from the JFET gate diffused regions and are reverse-biased so that depletion regions extend down to the substrate. The close spacing of the gate and isolation diffusion regions results in the gate and isolation depletion regions joining upon application of voltage to the gate to pinch off the transistor. The storage capacitors of the bucket-brigade stages are MOS devices formed by metal layers overlapping the JFET drain



electrode regions diffused in the epitaxial layer with the capacitor dielectric being a dielectric layer therebetween.

3,790,826

HIGH VOLTAGE GENERATING DEVICE HAVING AN OPERATIONAL MONITORING DEVICE

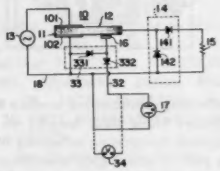
Takehiko Kawada, Yokohama, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1972, Ser. No. 316,474

Claims priority, application Japan, Dec. 23, 1971, 47-1306

Int. Cl. H04r *17/00*

U.S. Cl. 310—8.1 **21 Claims**



A high voltage generating device consisting of a ceramic transformer and a drive power source, said ceramic transformer being composed of a drive portion and electrical generating portion integral therewith and said drive power source being adapted to supply a drive voltage to said drive portion. This high voltage generating device is provided with a novel operational monitoring device which is adapted to operate for identifying the normal operation of said ceramic transformer by using the voltage induced to an electrical receiving unit located in the close vicinity of said electrical generating portion of said transformer.

3,790,827

PIEZO-ELECTRIC CONTROL DEVICE FOR CLOCK WORK AND THE LIKE TIMING SYSTEMS

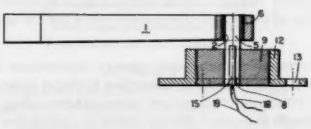
Louis C. C. Brunet, Le Bois Jettaz, Le-Vieux, and Pierre R. P. Corroyer, 82, Avenue de la Plaine, Annecy, both of France

Filed Nov. 18, 1971, Ser. No. 199,890

Claims priority, application France, Sept. 27, 1971, 71.36861

Int. Cl. H04r *17/00*

U.S. Cl. 310—9.4 **3 Claims**



A piezo-electric control device more particularly for clockwork. A vibrating rod is mounted at one end by means of a dielectric on the free end of a piezo-electric rod, the other

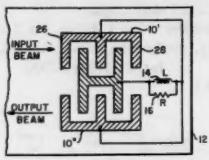
end portion of which is supported by a dielectric and flexible elastic bushing on a support adapted to be secured to the mounting plate of a watch or the like. Electrodes are applied to the piezo-electric rod, to transmit a voltage variation corresponding to the oscillating frequency of the vibrating rod to an electronic maintenance oscillator acting on a known device for maintaining vibration of the rod. The resulting device is highly accurate and, because there is no vibration transmitted to the watch casing and wrist band, the timing mechanism is in turn not affected by variable energy transferred from the environment, which would affect the isochronism of the vibrating rod.

3,790,828

ELECTROACOUSTIC SURFACE ACOUSTIC WAVE BEAM DEFLECTOR

Gene Chao, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 23, 1972, Ser. No. 265,867
Int. Cl. H04r *17/00*
U.S. Cl. 310—9.7 **5 Claims**



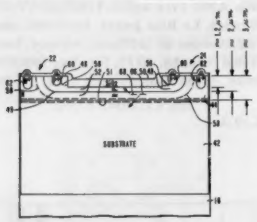
Means for reflecting a microwave surface acoustic wave to provide long delays (long path length) on normally sized piezoelectric crystals comprising reflecting transducers, each consisting of a pair of interdigital transducers in a back-to-back arrangement with electrical components for tuning out the distributed capacity of the transducers and for loading the transducers for maximum efficiency relative to their radiation resistance. The transducers and components are fabricated as thin films on a piezoelectric crystal substrate.

3,790,829

THERMOELECTROMAGNETIC ENERGY CONVERSION SYSTEM

Gregory L. Roth, 5712 Park West Cir., Alhambra, Calif.

Filed July 13, 1972, Ser. No. 271,246
Int. Cl. H02n *3/00*
U.S. Cl. 310—4 **16 Claims**



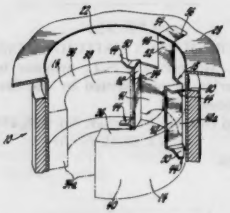
A thermoelectromagnetic energy conversion system includes a p-n semiconductor junction having a space charge region on either side thereof and a magnet providing a magnetic flux through the space charge region in a direction parallel to the junction, and a source of thermal energy. Electrical contact may be made to two end regions of the junction which are spaced apart in a longitudinal direction perpendicular to the flux direction and centrally located dielectric regions on either side of the depletion region permit electrical communication between the end regions only through the depletion region. As electrons and holes which are thermally generated within the space charge region drift toward the edges thereof, the magnetic flux provides a longitudinally directed force on the mobile carriers which establishes a voltage potential between the two end regions.

3,790,830

MAGNET MOUNTING CLIP FOR A DYNAMOELECTRIC MACHINE

Charles P. Bonfiglio, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 9, 1972, Ser. No. 279,044
Int. Cl. H02k *15/00*
U.S. Cl. 310—42 **2 Claims**



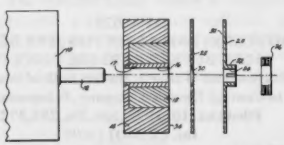
This disclosure relates to a magnet mounting clip for retaining arcuately shaped magnets within a cylindrical, annular housing of a dynamoelectric machine. The clip comprises a pair of deflectable bent end flanges positioned between the magnets and which are adapted to engage the respective end portions of the magnets to bias the magnets apart and into circumferential engagement with the inside of the housing. The clip also comprises a pair of end tabs on said bent end flanges and which are adapted to engage the respective opposite side portions of each magnet to retain the magnets in an axial relationship with each other within the housing. A key means or tab between the bent end flanges is also provided for cooperating with the housing to prevent circumferential and axial movement of the magnets relative to the housing.

3,790,831

APPARATUS FOR DAMPING OSCILLATIONS IN A STEPPING MOTOR

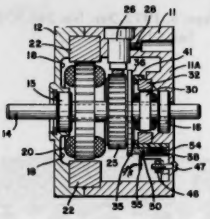
Anthony P. Morreale, Whittier, Calif., assignor to Computer Devices Corporation, Sante Fe Springs, Calif.

Filed June 9, 1972, Ser. No. 261,501
Int. Cl. H02k *7/02*
U.S. Cl. 310—74 **2 Claims**



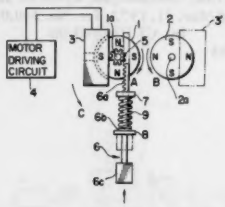
A stepping motor damping unit in which the freely rotating flywheel is journaled on the shaft of a stepping motor. The flywheel is provided with a permanent magnet. A plate of magnetic material is secured to the shaft of the motor and the magnet of the flywheel attracts it to the plate. A disk of friction material is positioned between adjacent parallel surfaces of the flywheel and the plate to provide a non-magnetic gap and at the same time provide wear-resistant low friction surfaces allowing for relative rotation between the plate and the flywheel.

3,790,832
MOTOR-TACHOMETER
Jayant K. Patel, Dayton, Ohio, assignor to TRW Inc., Cleveland, Ohio
Filed Feb. 3, 1972, Ser. No. 223,089
Int. Cl. H02k 47/04
U.S. Cl. 310—113 1 Claim



A combined motor and tachometer in a single housing incorporates an axial commutator for the motor and a radial commutator for the tachometer, in back-to-back relation, providing a maximum length reluctance path between the field for the motor and the field for the tachometer, and also between the armature of the motor and the armature of the tachometer. In this manner, the relatively sensitive tachometer is effectively isolated from adverse affects of the relatively heavier motor field.

3,790,833
SYNCHRONOUS MOTOR
Sukehiro Hasebe, Sukagawa, Japan, assignor to Kabushiki Kaisha Koparu, Yokyo, Japan
Filed May 24, 1973, Ser. No. 363,316
Claims priority, application Japan, May 26, 1972, 47/52357; May 26, 1972, 47/52358
Int. Cl. H02k
U.S. Cl. 310—162 3 Claims



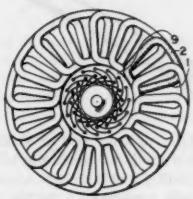
A non-self-starting type synchronous motor comprises a pair of permanent-magnet rotors rotatable in directions opposite to each other by means of magnetic coupling in order to prevent the rotational motion of the rotators from being stopped by step-out of the synchronous motion because of vibration or impact and also a field coil for giving a turning force to said pair of rotors.

3,790,834
LOW SPEED SYNCHRONOUS MOTOR
Tetsuro Tanaka, 2, Shimo-Kamo Yako-cho, Sadyo-ku, Kyotoshi, Japan
Filed Nov. 11, 1971, Ser. No. 197,872
Claims priority, application Japan, Nov. 21, 1970, 45/102415; Aug. 4, 1971, 46/58332
Int. Cl. H02k 19/02
U.S. Cl. 310—162 7 Claims

A plurality of stationary poles, each comprising a pair of sub-poles, are disposed in opposite relationship with a plurality of rotor magnet poles. The ratio of the number of stationary poles to the number of rotor magnet poles is chosen to be 2:3, 2:5 or 3:5 alternatively. A rotating magnetic field is produced in the array of stationary poles, and for every $\pi/2$ interval of the period thereof, the rotor maintains a stabilized position in which there exists at least one set of a stationary sub-pole and

a rotor pole of opposite polarities and attracted to each other. Also in this position, there exist an even number of sets of one sub-pole of a stationary pole and a rotor pole which are of like polarity, are displaced in angular position from each other and repel each other, these different sets producing a balance between their rotating efforts acting upon the rotor.

3,790,835
DISC ARMATURE
Naozi Takeda, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 7, 1972, Ser. No. 232,481
Claims priority, application Japan, Mar. 10, 1971, 46/13335; June 18, 1971, 46/44376; June 23, 1971, 46/45933; June 30, 1971, 46/48432; Oct. 4, 1971, 46/78072; June 30, 1971, 46/57492
Int. Cl. H02k 1/22, 13/04
U.S. Cl. 310—268 3 Claims

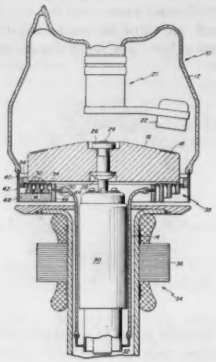


A disc armature having a plurality of armature coils assembled in the form of a disc, each coil comprising at least one turn of conductor covered with insulating sheath, the thickness of the effective portion of the armature winding or the coil side portion which lies within the field air-gap being equal to that of one individual armature coil and the coil end portions of the armature winding being thickner than the coil side portion since the coil ends of one individual armature coil overlap those of another, and the thicker coil end portions being accommodated in a space defined by the field magnet and the frame so that a very high space factor can be attained.

3,790,836
COOLING MEANS FOR ELECTRODES
Martin Braun, 1435 Bedford St., Stamford, Conn.
Filed Oct. 2, 1972, Ser. No. 293,904
Int. Cl. H01j 1/02, 7/24, 35/10
U.S. Cl. 313—13 20 Claims

An electron discharge device having a movable electrode within an evacuated envelope, and means comprising retracta-

ble elements associated with the envelope and movable into engagement with the electrode for providing a thermally con-



ductive path for dissipation of heat from the electrode outside the envelope.

3,790,837

METHOD OF MAKING A GAS- AND/OR VAPOUR DISCHARGE TUBE READY FOR OPERATION

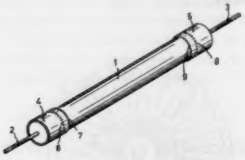
Abraham Timmermans, Emmasingel, Eindhoven, Netherlands

Filed May 4, 1972, Ser. No. 250,348

Claims priority, application Netherlands, May 8, 1971, 7106348

Int. Cl. H01j *1/02, 61/52*

U.S. Cl. 313—44 **6 Claims**



The invention relates to a method of making a discharge tube, for a high pressure sodium vapour discharge lamp, ready for operation by adjusting a heat shield. According to the invention the heat shield consists of a ductile metal strip provided with perforations. The heat shield is adjusted by tearing off a portion of this heat shield on these perforations until the correct temperature is obtained in the operating condition of this discharge tube.

3,790,838

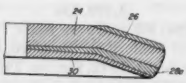
X-RAY TUBE TARGET

Charles L. Baum, Stamford, Conn., assignor to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed Feb. 27, 1973, Ser. No. 336,283

Int. Cl. H01j *35/10*

U.S. Cl. 313—60 **11 Claims**



A target for anodes of X-ray tubes, particularly rotating anodes, having a compensated bimetallic structure which comprises a base matrix carrying coatings of selected material on both opposed surfaces for resisting distortion caused by high thermal energies.

3,790,839

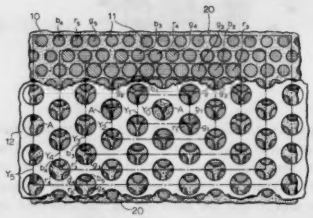
RECTANGULAR GRADE BLACK SURROUND SCREEN

Leonard Dietch, Skokie, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 4, 1972, Ser. No. 240,931

Int. Cl. H01j *29/32*

U.S. Cl. 313—92 R **7 Claims**



The screen structure of a black surround type rectangular color cathode ray tube has a plurality of viewable image elements which decrease in area from the center of the faceplate to the periphery. However, instead of having a uniform grade in all radial directions from the center, the viewable image elements of similar area are located along a substantially rectangular locus centered with respect to the face plate.

3,790,840

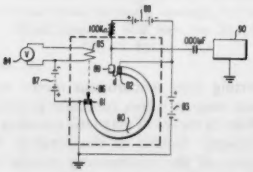
SECONDARY ELECTRON MULTIPLYING DEVICE USING SEMICONDUCTOR CERAMIC

Minoru Toyoda, Takatsuki, Japan, assignor to Murata Manufacturing Co., Ltd., Otokuni-gun, Kyoto-fu, Japan

Filed Mar. 31, 1972, Ser. No. 240,032

Int. Cl. H01j *43/00*

U.S. Cl. 313—105 **11 Claims**



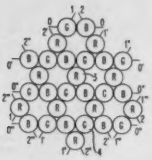
A secondary electron multiplying device having high sensitivity for various kinds of electrically charged particles (e.g. electrons, positive ions, negative ions), X-rays, radio active rays, etc., is made of a molded article of a zinc oxide-titanium oxide type semiconductor ceramic, and is provided with at least two electrodes and having at least one hole. The molded article of the device can be produced in form of a single tube or a bundle of a plurality of such tubes. Electrons fed into the tube or tubes impact with the semiconductor ceramic causing secondary electron emission and the number of electrons emitted is greater than the number of electrons fed into the device.

3,790,841

GAS DISCHARGE DISPLAY FIELD FOR MULTICOLOR DISPLAY

Frank Tsui, and Katherine Tsui, both of Boeblingen, Germany, assignors to International Business Machines Corporation, New York, N.Y.

Filed Jan. 15, 1973, Ser. No. 323,585
Int. Cl. H01j 1/62
U.S. Cl. 313—108 B 10 Claims



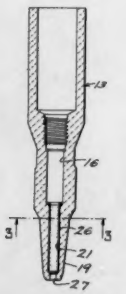
A gas discharge display/storage apparatus in which a multicolor display is achieved by a combination of a modified plasma display apparatus and associated cell driving configuration. The apparatus includes two display panels in a sandwich arrangement having one common drive line, the drive system comprising a three-coordinate nonorthogonal selections system, each of the coordinates being displaced by 120°. The individual cells may be arranged in various configurations, each cell having a phosphor representative of one of three basic colors, red, blue and green, whereby coincident selection of selected cells provide the multicolor display.

3,790,842

SPARK PLUG

Frank A. Westenkirchner, Toledo, Ohio, and Paul E. Rempes, Jr., Royal Oak, Mich., assignors to Champion Spark Plug Company, Toledo, Ohio

Division of Ser. No. 224,456, Feb. 8, 1972. This application Mar. 5, 1973, Ser. No. 337,916
Int. Cl. H01t 13/16
U.S. Cl. 313—118 3 Claims



In a spark plug including an insulator mounted in a tubular shell and an electrode assembly mounted within a bore through the insulator and projecting from a nose portion of the insulator to define a spark gap with a ground electrode, a method for improving the resistance of the nose portion to cracking caused by thermal stresses. The electrode assembly includes a high heat conducting portion in close proximity with the wall of the portion of the bore extending through the nose portion of the insulator. The method comprises applying a coating of a glaze slip to the interior wall of the portion of the insulator bore which will be in proximity with the heat conducting portion of the electrode and then firing the glaze at a controlled time and temperature to form an uninterrupted glassy coating on at least the portion of the nose bore adjacent the end of the insulator. The fired glaze must have a lower coefficient of thermal expansion than the insulator, an appreciably lower thermal conductivity than the insulator and a softening temperature above the highest operating temperature encountered by the glazed bore wall.

ERRATUM

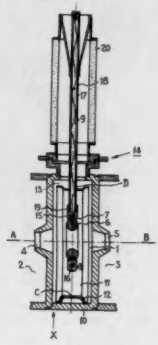
For Class 313—299 see:
Patent No. 3,790,000

3,790,843

ELECTROSTATIC FOCUSSING DEVICES ESPECIALLY FOR MICROWAVE TUBES

Alain Bert; Roger Enjalbert, and Pierre Kern, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 5, 1972, Ser. No. 241,163
Claims priority, application France, Apr. 27, 1971, 71.14989
Int. Cl. H01j 23/08
U.S. Cl. 315—5.34 9 Claims



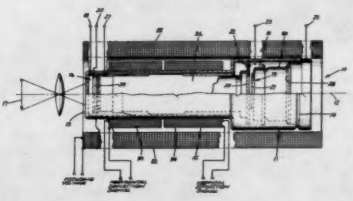
The focussing devices of the invention comprise a metal electrode (6) assembled in the envelope (10) through which the electron beam being focussed propagates, said assembly being realised by means of a fixing system comprising a flexible skirt (11) attached around the envelope, and rigid insulating components rigidly attached on the one hand to the electrode (6) and on the other to the skirt (11).

3,790,844

IMAGE COMPARISON TUBE AND METHOD OF COMPARING RADIATION IMAGES

C. Scott Nevin, Albion, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 22, 1965, Ser. No. 465,922
Int. Cl. H01j 31/48
U.S. Cl. 315—11 12 Claims



An image comparison tube stores a first image on a storage electrode and projects a deflectable second image thereon to

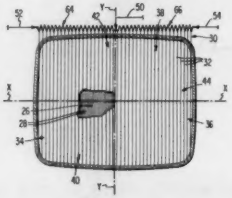
provide an output signal dependent upon the coincidence of the two images. Electrons generated by the second image passing through the storage electrode are accelerated and focused onto a collector anode which may be a portion of an electron multiplier or a display screen.

3,790,845

FOCUS-GRILL CATHODE-RAY TUBE IMAGE REPRODUCER MODULATION WITH GRILL VOLTAGE

Francis Joseph Campbell, Yardley, Pa., assignor to RCA Corporation, New York, N.Y.

Filed June 28, 1972, Ser. No. 267,063
Int. Cl. H01j *29/70*
U.S. Cl. 315—31 R **5 Claims**



Voltage applied to the grill of a focus-grill, color cathode ray tube is modulated at vertical scanning frequency. When scanning along the top and bottom edge portions of the grill, potential applied to the intermediate portion of the grill is increased, thereby correcting for overfocus in the vicinity of the vertical axis by narrowing the width of the focused electron beam on the screen. This avoids color impurity at the top and bottom regions of the screen. When scanning along the region of the horizontal axis, potential applied to the intermediate portion of the grill is decreased, thereby correcting for underfocus in the vicinity of the vertical axis by narrowing the width of the focused beam and thus avoiding color impurity in that region. The voltage modulations are progressively proportioned or damped by resistor means in directions outwardly toward the left and right edge portions of the grill, to which constant potential is applied. Damping the applied voltage modulation to a constant potential avoids color impurity at the edge portions, which have very high color purity sensitivity to grill voltage change.

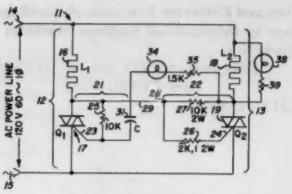
3,790,846

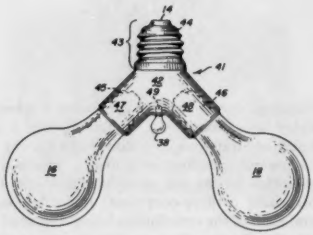
AUTOMATIC LOAD MONITORING AND TRANSFER CIRCUIT

Marion H. Morris, 1810 Austin Ave., Los Altos, Calif.

Filed Dec. 18, 1972, Ser. No. 316,263
Int. Cl. H05b *39/10*
U.S. Cl. 315—91 **10 Claims**

Primary and standby loads are connected in parallel with a source of AC power. Primary and standby bidirectional thyristors are connected in series with the primary and standby loads respectively. Gate control circuits for the bidirectional thyristors are coupled together in such a manner that as one of the gate control circuits is energized it shunts current from the other to provide a bistable mode of operation. A phase shifter is provided for advancing the phase of the gate current to the primary thyristor relative to the phase of the gate current to the standby thyristor to initiate operation of the primary load. Upon an open circuit failure of the primary load, operation automatically switches to the standby load. The entire load monitoring and transfer circuit is conveniently housed in a twin lamp light socket. An indicator light is provided for indicating that the standby load is in operation or that the standby load is good as held in reserve.



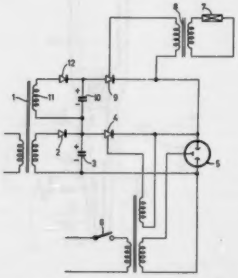


3,790,847

ARRANGEMENT PROVIDED WITH AN ELECTRONIC FLASH BULB

Harald Hintz, Hamburg, Germany, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,373
Claims priority, application Germany, Mar. 1, 1969, P 19 10 544.3
Int. Cl. H05b *37/00*
U.S. Cl. 315—151 **13 Claims**



The invention relates to an arrangement provided with an electronic flash bulb which is fed from a main capacitor.

In a known arrangement a so-called quench tube is arranged across the bulb. This quench tube is ignited when sufficient light is emitted by the bulb. A drawback of the known arrangement is that the main capacitor is substantially discharged when this quench tube is ignited.

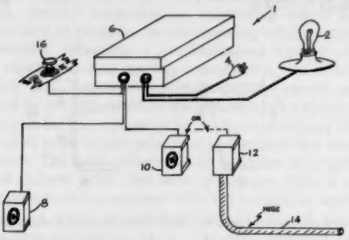
The invention provides a solution wherein the bulb is fed through a thyristor which is extinguished after some time by a circuit including a second thyristor. The advantage is that the main capacitor is now less discharged and the arrangement is thus sooner ready for the next flash.

3,790,848

AUTOMATIC LIGHT CONTROL SYSTEM

Thomas K. Y. Lai, 38A Nialopa Pl., Honolulu, Hawaii

Filed Apr. 10, 1972, Ser. No. 242,351
Int. Cl. H05b *37/02, 39/04, 41/36*
U.S. Cl. 315—155 **18 Claims**



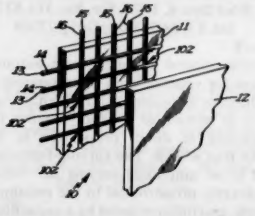
Garage lights are automatically turned on by a photocell which is illuminated by automobile headlights. A timing circuit keeps the lights on for a predetermined period after automobile headlights are turned off. House current is stepped down, rectified and smoothed. Direct current is applied across a variable voltage divider. A starter which may be a push button, a headlight receiving photocell or a roll over switch supplies voltage to a mid point of the divider. Voltage at the mid point is reduced during daylight hours by an exterior photocell in a conductive condition. During darkness the exterior photocell's high resistance as compared to the low resistance of a headlight actuated photocell creates a high mid point voltage. The high mid point voltage breaks down a zener diode, gating current to a capacitor and biasing an electronic switch for turning on the garage lights. When the voltage applied to the breakdown device falls, the gate turns off, and the capacitor slowly discharges through a resistor. A directional limiting device in the gate and cascaded transistors in the switch biasing connection prevent discharge of the capacitor except through the desired resistor. The electronic switch employs cascaded transistors for controlling the application of direct current to a reed relay. Power contacts of the relay complete a diac circuit, which biases on a triac, turning on the lights.

3,790,849

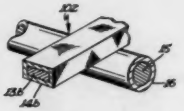
CAPACITIVE MEMORY GAS DISCHARGE DISPLAY DEVICE HAVING INTERNAL CONDUCTORS

William N. Mayer, White Bear Lake; Richard A. Strom, Minneapolis, and Meredith S. Ulstad, Edina, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 24, 1972, Ser. No. 247,073
Int. Cl. H05b *37/00*
U.S. Cl. 315—169 TV **2 Claims**



A capacitive memory gas discharge display device having a pair of drive lines for each cell of the device located directly within the gaseous environment. The conductors are at least partially covered with a dielectric serving as a means of providing a uniform spacing between the wires, a means to keep the wires from shorting and a means for developing a capacitive charge from the firing of the cell, such charge



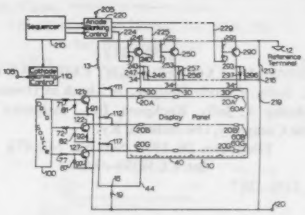
providing a memory for the particular cell such that the voltage required for refiring the cell is less, by the amount of the charged voltage, than the voltage required for the initial firing.

3,790,850

APPARATUS FOR OPERATING MULTIPLE POSITION DISPLAY TUBES

John C. Doane, Somerset; George E. Holz, North Plainfield; James A. Ogle, Neshanic Station, and Arpod Samlyody, Somerville, all of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 1, 1973, Ser. No. 328,761
Int. Cl. H05b *41/00;* **H01j** *17/48*
U.S. Cl. 315—169 TV **19 Claims**



The apparatus of the invention is adapted for operating multiple position display devices having a plurality of groups of display cathode segments or elements, with corresponding elements electrically interconnected, an anode electrode associated with each group of display segments, and an auxiliary electrode common to all of the groups of electrodes for preventing spurious glow between them. The simplified circuit biases the OFF cathodes from a voltage divider common to them and the auxiliary electrode, thus eliminating separate biasing for the OFF cathodes. The signals applied to the display tube or panel are also blanked during an interval in advance of signal transitions in the device, for inhibiting spurious glow under varying conditions of operation. Voltage divider apparatus also is provided for biasing the OFF anodes in a nonconductive state at a potential proportional to the tube bias potentials.

3,790,851

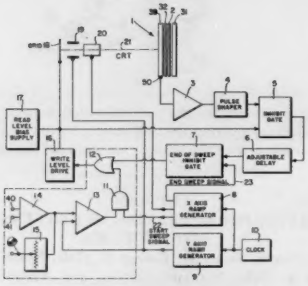
ELECTRON BEAM TUBE WITH MOVING DISPLAY OR MEMORY

John A. Baring, Golden, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 25,882, April 6, 1970, abandoned.
This application Aug. 9, 1972, Ser. No. 278,960
Int. Cl. H01j *29/70*
U.S. Cl. 315—22 **10 Claims**

A signal display tube includes composite strips placed uniformly across a phosphor coating of the screen. Each strip comprises a photoconductive, a conductive and an insulative member. The electron beam sweeps the viewing screen with an intensity insufficient to excite the phosphor coating. The presence of a bright spot is sensed by an adjacent composite

strip, which then causes the electron beam to produce a new bright spot. The time involved between sensing existing spots



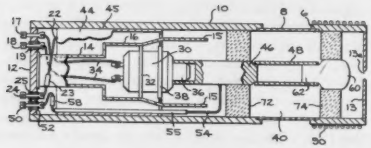
and producing new ones is such that the existing bright spots either move laterally or are refreshed in the same position.

3,790,852

MICROWAVE-EXCITED LIGHT EMITTING DEVICE

Larry R. Bolin; Claude Hopper, Jr., both of Owensboro, Ky., and Shelby A. Jolly, Rockport, Ind., assignors to General Electric Company, Owensboro, Ky.

Filed Apr. 28, 1972, Ser. No. 248,478
Int. Cl. H05b *41/24*
U.S. Cl. 315—267 **9 Claims**



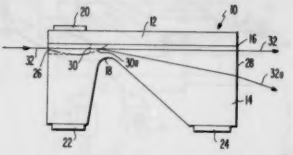
A microwave-excited light emitting device is provided comprising an electrodeless evacuated discharge lamp containing ionizable elements and mounted in the frequency determining resonator of a microwave oscillator. The oscillator resonator is tuned to provide a microwave frequency of sufficiently high frequency to provide ionization and excitation of the elements within the electrodeless discharge lamp while mitigating deterious ion bombardment of the walls of the electrodeless discharge lamp. By placing the lamp in the oscillator resonator any changes in the electrical characteristics of the lamp after firing will cause a frequency change in the oscillator allowing the lamp and the oscillator to remain in tuned relationship. However, the oscillator is further provided with thermal isolation means to isolate the lamp from the active device within the oscillator such as a vacuum tube or a solid state device. The light-emitting device is further provided with heating means to conduct externally generated heat to the lamp thermally independently of the active device. In this manner the lamp may be operated at a steady, and preferably elevated, temperature without exposing the active device to excessive heat which would have a deleterious effect on the life of the active device.

3,790,853

SEMICONDUCTOR LIGHT RAY DEFLECTOR

Jacques Isaac Pankove, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 19, 1973, Ser. No. 325,074
Int. Cl. H01l *15/00*
U.S. Cl. 317—235 R **8 Claims**



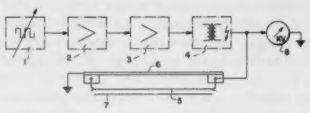
A semiconductor light ray deflector is presented which provides for the deflection of rays of light due to changes in the refractive index within a semiconductor caused by modulation of the distribution of excess carriers in the semiconductor.

3,790,854

APPARATUS FOR REMOVING STATIC CHARGE FROM WEBS OF MATERIAL

Kurt Dryczynski; Heinz Kramer; Dieter Messner, and Walter Seifried, all of Wiesbaden-Biebrich, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden, Biebrick, Germany

Filed Sept. 7, 1971, Ser. No. 178,313
Claims priority, application Germany, Sept. 10, 1970, 2044828
Int. Cl. H05f *3/04*; **H01t** *19/00*
U.S. Cl. 317—2 F **29 Claims**



This invention relates to a method and apparatus for discharging a statically charged web of material. The method comprises bombarding the web with charge carriers produced by a high-frequency A.C. voltage of 1 to 1,000 kilocycles per second and having a current intensity of between a few μ amp./cm of web width and several hundred μ amp./cm of web width.

3,790,855

ELECTRONIC CONTROL MODULE FOR ANTI-SKID BRAKING SYSTEMS

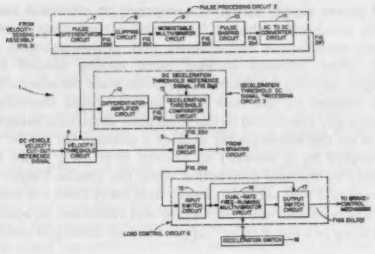
Allen F. Hillman, Jr., Muncy, Pa., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 4, 1972, Ser. No. 311,927
Int. Cl. B60t *8/08*; **G01p** *15/08*
U.S. Cl. 317—5 **15 Claims**

An electronic control module for an automatic anti-skid braking system for vehicles such as automobiles. A velocity-sensing mechanism associated with a vehicle operates while the vehicle is in motion to produce a pulse train having a frequency varying in direct proportion to the rotational velocity of the rear wheels. The varying-frequency pulse train is converted to an amplitude-varying dc "velocity" voltage signal, also directly proportional to the rotational velocity of the rear wheels, and differentiated by a capacitor included in a differentiator-amplifier circuit to produce positive-going and negative-going voltage pulses corresponding respectively, to increases and decreases in the voltage level of the "velocity" voltage signal. The negative-going voltage pulses, corresponding to decreases in velocity, are then amplified and inverted by

the differentiator-amplifier circuit and compared with a dc "-deceleration" reference voltage having a value corresponding to a predetermined value of wheel deceleration existing during braking of a vehicle and indicating the imminence of a skidding or wheel lock-up situation.

If the wheel deceleration of a vehicle being braked exceeds the predetermined value of wheel deceleration at any given moment, thereby indicating an impending wheel lock-up situation, and, in addition, the decelerating vehicle is traveling at a velocity exceeding a predetermined cut-out velocity below which anti-skid braking operation is not considered necessary (e.g., below five miles/hour), an output pulse is produced by the differentiator-amplifier circuit which exceeds the value of the dc "deceleration" reference voltage level. A load control pulse is then produced and applied to a load control circuit. The load control circuit operates in response to the load control pulse, and also to voltages from a vehicle deceleration switch associated with the vehicle, to apply to a load (e.g., a brake-control mechanism) control signals of either a first repetition rate or a second repetition rate for



releasing the brakes of the vehicle. Control signals of the first repetition rate are applied to the load when a first voltage is produced by the deceleration switch during an impending wheel lock-up situation and control signals of the second repetition rate are applied to the load when a second voltage is produced by the deceleration switch during an impending wheel lock-up situation. The first voltage is produced by the deceleration switch when the vehicle being braked is decelerating at a rate less than a predetermined rate and, when it occurs during an impending wheel lock-up situation, indicates that the road surface on which braking is taking place has a low coefficient of friction, that is, it is a wet road surface or a snow, ice, or oil-covered surface. The second voltage is produced by the deceleration switch when the vehicle being braked is decelerating at a rate greater than the predetermined rate and, when it occurs during an impending wheel lock-up situation, indicates that the road surface on which braking is taking place has high coefficient of friction, that is, it is a dry road surface.

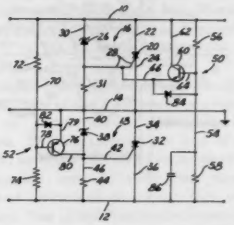
3,790,856

OVERVOLTAGE PROTECTION CIRCUIT FOR DUAL OUTPUTS OF OPPOSITE POLARITY

Homer F. Hutchinson, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 4, 1973, Ser. No. 367,064
Int. Cl. H02h *3/20*
U.S. Cl. 317—16 **11 Claims**

An overvoltage protection circuit for two output circuits having output voltages of opposite polarity relative to ground includes a crowbar overvoltage protection circuit for each of the outputs, each comprising a thyristor which is triggered by a zener diode which becomes conductive if the voltage of the output exceeds a predetermined value. The two crowbar circuits are interconnected so that triggering of either of the



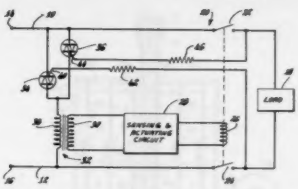
thyristors will trigger the other thyristor and clamp both output circuits to approximately ground potential.

3,790,857

PROTECTIVE CIRCUIT FOR NONSEQUENCING MULTIPOLE GROUND FAULT CIRCUIT INTERRUPTER

Sung Chuel Lee, Bridgeport, and Paul Muchnick, Norwalk, both of Conn., assignors to Harvey Hubbell Incorporated, Bridgeport, Conn.

Filed Dec. 29, 1972, Ser. No. 319,186
Int. Cl. H02h *3/28*
U.S. Cl. 317—18 D **15 Claims**



A protective circuit for a ground fault interrupter having a multipole circuit interrupter for ensuring that the sensing and actuating circuit is energized as soon as any one of the poles of the circuit interrupter closes, thereby preventing potential hazards. More specifically, switching devices each responsive to the closing of a different pole are connected between the sensing and actuating circuit and the power source. As soon as any one of the poles closes, the sensing and actuating circuit is energized. The circuit is arranged so that the sensing and actuating circuit is deenergized when all the poles are open to reduce the consumption of energy and the wear on the circuit components.

3,790,858

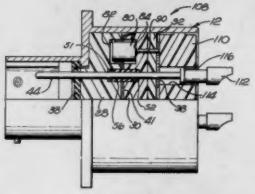
ELECTRICAL CONNECTOR WITH COMPONENT GROUNDING PLATE

Salvatore T. Brancaleone, Scottsdale, and Leland W. Oliver, Tempe, both of Ariz., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 29, 1973, Ser. No. 327,682
Int. Cl. H05k *7/04*
U.S. Cl. 317—99 **14 Claims**

An electrical connector in which circuit components are integrated into the connector by mounting the same within the grounding plate in the shell of the connector. Conductors of the circuit components are connected to selected electrical contact elements in the connector preferably by means of a

printed circuit board which is removably mounted in the shell of the connector. Examples of circuit components which may



be integrated into the connector are electro-magnetic pulse absorbers and radio frequency filter elements.

3,790,859

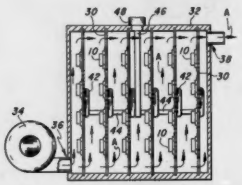
ELECTRONIC PACKAGE HEADER SYSTEM HAVING OMNI-DIRECTIONAL HEAT DISSIPATION CHARACTERISTIC

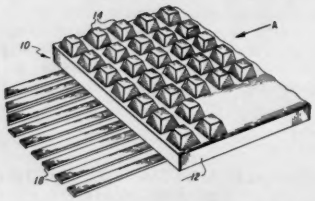
Charles R. Schraeder; Samuel N. Rea, both of Dallas; Yung Tao, Richardson, and Elias G. Hanna, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 12,749, Feb. 19, 1970, abandoned. This application Mar. 7, 1972, Ser. No. 232,502

Int. Cl. H05k *2/20*

U.S. Cl. 317—100 **7 Claims**





Disclosed is an improved header system for an electronic package of the type used to support and enclose integrated circuits, for example, which system advantageously provides omni-directional heat dissipation characteristics through the novel utilization of a plurality of spaced members that are secured to and protruding from at least one surface of the main body of the header system and are in the flow path of a fluid coolant.

3,790,860

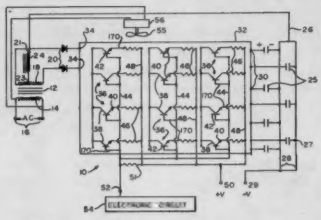
POWER SUPPLY CHASSIS ASSEMBLY FOR ELECTRONIC CIRCUIT WITH COOLING

Anthony Verdisco, Port Jefferson Station, N.Y., assignor to Trygen Electronics, Inc., Westbury, N.Y.

Filed July 17, 1972, Ser. No. 272,338

Int. Cl. H05k *7/20*; **H02b** *1/04*

U.S. Cl. 317—100 **2 Claims**



A power supply assembly comprises an electrical and thermally conductive chassis frame and a base plate carrying a power transformer and a choke coil. A sub-assembly on the base plate includes another plate having spaced parallel flanges carrying semiconductive solid state members. Spaced bars carried by the base plate and insulated therefrom are electrically connected to the solid state electronic members. A hood on the subassembly defines a passage for an air stream (provided by a blower) to convey heat away from the assembly by thermal convection while the chassis frame, plates, flanges and bars serve to convey heat away from the solid state members by thermal conduction and radiation, in addition to servicing as a mechanical support and an electrical conductor.

3,790,861

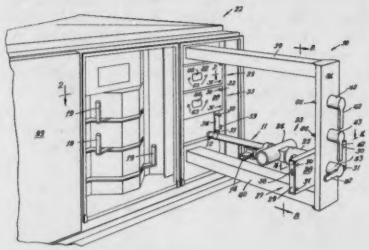
SWITCHGEAR WITH FUSES INDIVIDUALLY MOUNTED ON FUSE CARRIERS AND SWITCHES THEREFOR FOR INTERLOCKS

Gerald Sakats, Arlington Heights, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Oct. 10, 1972, Ser. No. 295,826

Int. Cl. H02b *1/18*

U.S. Cl. 317—114 **14 Claims**

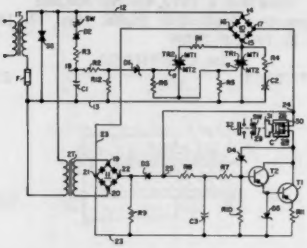


High voltage fuses are mounted on individual carriers for movement into and out of engagement with stationary contacts under the control of a carriage that can be connected to any or all of the carriers. Switches are arranged to connect any or all of the fuses in circuits. A locking bolt holds each fuse carrier in closed position and can be moved to locking position only when the fuse carrier is closed. Interlocks between the fuse carriers and operators for the switches prevent opening the carrier when the switches are closed and closure of the switches when the carriers are open.

3,790,862
EXCITATION CONTROL CIRCUIT FOR ELECTROMAGNET COIL

Julian C. Kampf, Grafton, and Kenneth W. Retzer, Wauwatosa, both of Wis., assignors to Square D Company, Park Ridge, Ill.

Filed Dec. 21, 1972, Ser. No. 317,448
Int. Cl. H01h 47/32
U.S. Cl. 317—148.5 R 10 Claims

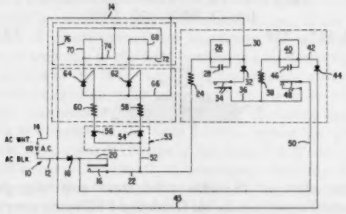


A circuit controlling the flow of direct current in a coil winding of a contactor from an alternating current source. The circuit includes a pair of full wave bridge rectifiers connected to be energized by the source so the rectifiers have unequal output voltages. The rectifiers have output terminals connected to the base, emitter and collector circuits of a transistor and the coil winding so the output of the higher voltage rectifier provides the base to emitter current for the transistor and energizes the coil when both rectifiers are energized and the transistor conducts current induced in the coil winding when the control circuit is de-energized to shorten the drop-out time of the contactor.

3,790,863
SCR CONTROL CIRCUIT

Laurence Allan Cross, Jr., Groveville, N.J., assignor to Randomatic Data Systems, Inc., Trenton, N.J.

Filed Oct. 20, 1972, Ser. No. 299,315
Int. Cl. H01h 47/32
U.S. Cl. 317—148.5 B 9 Claims



Closure of a switch controlling flow from a source of alternating current effects a single triggering of a silicon controlled rectifier to produce a precisely timed pulse of a given, uniformly maintained magnitude, utilized to actuate a solenoid or other load. On closure of the switch, the circuit becomes operative only upon the initiation or the ascendancy of the next positive half of an AC sine wave, to energize a relay that operates to trigger one or more SCR's during the negative half of the same wave. A Class F commutation of the SCR occurs during the positive half of the next following sine wave. Means is included in the circuit to prevent re-triggering of the SCR if the switch is held closed, thus to produce one and only one load-actuating pulse of a duration precisely timed at less than a single cycle of alternating current.

3,790,864
ALKALINE ELECTROLYTES FOR CELLS WHICH PROVIDE EFFICIENT COULOMBIC STORAGE AND TRANSFER FUNCTIONS

Raffaele F. Muraca, Los Altos Hills, Calif., assignor to Western Applied Research and Development, Inc., Menlo Park, Calif.

Filed July 24, 1969, Ser. No. 844,665
Int. Cl. H01g 9/00
U.S. Cl. 317—231 8 Claims

There are disclosed compositions of alkaline electrolytes for use in electrolytic cells of the kind which are intended to provide accurate or reproducible coulombic storange and transfer functions. The electrolytes are free of dissolved oxygen and contain, among a variety of ionic species in solution, the complex-cyanide ions of only one reversibly electrodepositable and electrosoluble metal; they may also contain borate buffers. The initial dissolved-oxygen content of the electrolytes may be removed by an excess of alkali metal or alkaline earth sulfite; because excess sulfite acts as an oxygen scavenger, the electrolytes may be loaded into electrolytic cells in a normal air environment.

3,790,865
PLURALITY OF ELECTRICALLY CONNECTED SEMICONDUCTORS FORMING A HIGH VOLTAGE RECTIFIER

Theodor Tovar, Nuremberg, Germany, assignor to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nurnberg, Germany

Filed Aug. 2, 1971, Ser. No. 168,337
Claims priority, application Germany, July 31, 1970, 2038070
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 11 Claims

A semiconductor high voltage rectifier including a plurality of strips of insulating material, each strip containing a plurality of openings. One of the strips contains a semiconductor wafer within each of its plurality of openings while, two of the strips contain a conducting body within each of their openings. The strips are assembled as a unit by two end caps so that the wafers are bounded on each side by a strip containing the conducting bodies. The assembly is such that the conducting bodies each engage a conducting surface of a wafer. A series circuit is established by connecting each successive pair of conducting bodies by conducting strips and the two conducting caps with the conducting bodies closest thereto by conducting strips, with the caps constituting the external terminals of the rectifier.

3,790,866
SEMICONDUCTOR DEVICE ENCLOSURE AND METHOD OF MAKING SAME

Carl L. Meyer, and Eugene H. Sayers, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 14, 1973, Ser. No. 360,366
Int. Cl. H01l 5/00
U.S. Cl. 317—234 R 7 Claims

An economical power transistor housing and method for making it. The housing base member is of a reinforced plastic

with a unique circuit pattern on it. A metal heat sink member nests in an aperture in the base member and connects with the circuit pattern. The heat sink has orientation means. A semiconductor device die with mutually parallel wire bond contact pads is affixed to the heat sink member in a predetermined manner. Terminal pins extend through the base member and connect with uniquely configured discrete portions of the circuit pattern. These portions have elongated mutually parallel wire bonding areas oriented perpendicular to the contact pads on the die. A cup-shaped cover encloses the die and associated wire bonds on the board. The structure permits automated assembly, soldering and wire bonding, and includes the manufacture of subassemblies for testing prior to device completion.

3,790,867

LIGHT-INTENSIFYING DEVICE

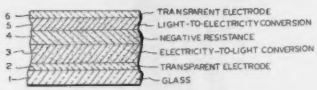
Shigeru Hayakawa, Osaka, Japan, assignor to Matsushita Electric Industral Co., Ltd., Osaka, Japan

Filed Feb. 16, 1973, Ser. No. 332,793

Claims priority, application Japan, Feb. 22, 1972, 47-18691

Int. Cl. H01l *15/00*

U.S. Cl. 317—234 R **5 Claims**



A light-intensifying device comprises a panel of integrated layers composed of a transparent base, a first transparent electrode layer, a photoconductive layer, a negative resistance layer, an electroluminescent layer, and a second transparent electrode. The device can prevent the halation appearing around the bright field of an output image.

3,790,868

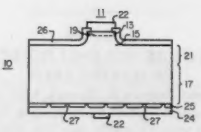
EFFICIENT RED EMITTING ELECTRGLUMINESCENT SEMICONDUCTOR

Richard W. Soshea, Portola Valley, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 27, 1972, Ser. No. 301,705

Int. Cl. H05b *33/00*

U.S. Cl. 317—235 R **6 Claims**



A solid state light source includes a gallium arsenide phosphide electroluminescent semiconductor in a mesa structure, a substrate substantially transparent to the radiation emitted by the semiconductor, a region of varying composition connecting the substrate to the semiconductor, and a reflective backing.

3,790,869

HUMIDITY SENSITIVE SEMICONDUCTOR DEVICE

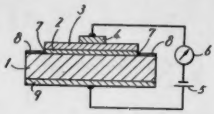
Shigeru Tanimura, Kyoto; Nobuaki Miura, Nagaokakyo; Osamu Asano, Nagaokakyo, and Nobuyuki Yamamura, Takatsuki, all of Japan, assignors to Omron Tateisi Electronics Co., Okyo-ku, Kyota, Japan

Filed Nov. 8, 1972, Ser. No. 304,808

Claims priority, application Japan, Nov. 10, 1971, 46-90138; Mar. 21, 1972, 47-28789

Int. Cl. H01l *9/00*

U.S. Cl. 317—235 T **27 Claims**



A semiconductor composite having a rectifying and humidity sensitive characteristic is provided by depositing a tin oxide film on a semiconductor substrate, preferably with an insulating film of a semiconductor compound such as SiO_2 of a thickness of 15A to 500A therebetween, and by exposing a portion of the barrier to the atmosphere. It was observed that the rectifying characteristic of the composite becomes easy at a quick response rate at an avalanche current region as the ambient relative humidity is increased and that the composite as supplied with a predetermined reverse bias voltage higher than a breakdown voltage of the composite shows a change in the reverse current at a quick response rate in reverse proportion to the relative humidity of the atmosphere. It was also observed that interposition of the insulating film between the SnO_2 film and the semiconductor substrate in a preferred embodiment decreases the reverse leakage current, raises the reverse breakdown voltage and makes uniform the reverse breakdown voltage.

3,790,870

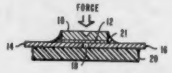
THIN OXIDE FORCE SENSITIVE SWITCHES

Robert J. Mitchell, 1180 E. Rubio St., Altadena, Calif.

Filed Mar. 11, 1971, Ser. No. 123,245

Int. Cl. H01l *3/00, 5/00*

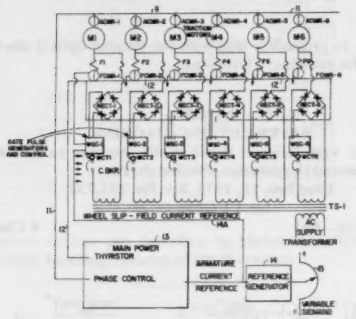
U.S. Cl. 317—238 **22 Claims**



A new class of bi-stable solid state switching devices, designated Force Switchable Diodes or FSD's, are provided by copper/cuprous oxide rectifying or "blocking" junction devices, exemplified in elemental form by a copper substrate, a contacting thin cuprous oxide layer and the interface between them, such devices are arranged to avalanche from a blocking state to an essentially conducting state on the application of force when under a related voltage, and avalanche back to a blocking state on the removal of at least a portion of that force. The transition between the states is sharp, predictable and free of arcing effects. A single copper/cuprous oxide junction provides unidirectional switching, and an assembly comprising a set of copper/cuprous oxide/copper junctions provides bi-directional switching or polarity insensitivity. Deswitching does not require a reduction of applied voltage, nor does switching require an increase in applied voltage. Force Switchable Diodes, however, provide an inverse relationship between switching force and voltage, and a positive relation-

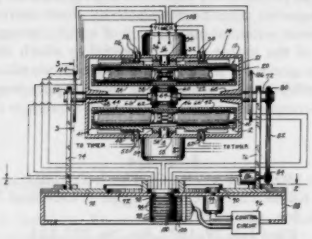
ship between switching force and thickness of the cuprous oxide layer. The invention provides for both discrete switches and integrated matrix switching arrays, and further comprises mechanical and electrochemical methods of forming blocking junctions.

3,790,871
INDIVIDUAL AXLE WHEEL SLIP CONTROL SYSTEM
Russell M. Smith, North East, Pa., assignor to General Electric Company, Erie, Pa.
Filed Jan. 2, 1973, Ser. No. 322,896
Int. Cl. B61c *15/12*
U.S. Cl. 318—52 **12 Claims**



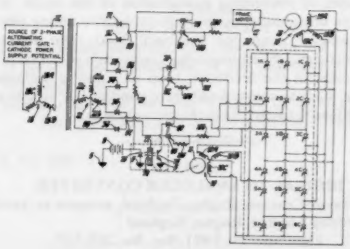
An individual axle wheel slip control system for electric traction motor drives employing series type direct current traction motors is described. With this system an auxiliary source of direct current is connected to the series field winding of each individual traction motor in parallel with and in addition to the normal direct current excitation with the polarity of the auxiliary source of direct current being such that when added to the normal excitation direct current, results in a reduction of the armature current and consequently a reduction in the tractive effort of the traction motor. A field current sensor responsive only to the field current of the traction motor being controlled, is provided along with a phase control circuit which is responsive to the output of the field current sensor and to a reference signal source for establising a reference median value of field current. The phase control circuit in turn is coupled to and controls the output of the auxiliary source of direct current for increasing the auxiliary field current in response to the field current sensor detecting a sudden decrease in the field current of the traction motor below the reference median value such as which would be produced upon the occurrence of slippage. A rate of change responsive network is coupled to the field current sensor for detecting relatively rapid rates of change in the sensed field current such as would occur with a rapidly accelerating wheel slip. The rate of change network is coupled to and additionally controls the phase control circuit for further increasing the auxiliary field current supplied to the field winding of the traction motor upon the occurrence of rapidly accelerating wheel slip. A sensitivity modifying circuit is provided for decreasing the sensitivity of the rate of change network for increasing values of field current whereby for relatively low values of field current, relatively fast and large auxiliary field current corrections are provided, and for relatively large values of field current, the auxiliary field current correction is slower and of lower value. The wheel slip control system further includes an overload protection circuit that is coupled to and controls the wheel slip control circuit and that is responsive to a current transformer that senses the overall value of the auxiliary field current supplied to the traction motor. By this arrangement the level of auxiliary field current being supplied from the auxiliary direct current source is regulated to some predetermined maximum level upon the current transformer sensing an overcurrent condition.

3,790,872
IMPULSE ENGINE
Arthur J. Gaffney, W232 S8785 Bronk Dr., Big Bend, Wis.
Filed Mar. 16, 1972, Ser. No. 235,375
Int. Cl. H02k *7/06*
U.S. Cl. 318—139 **10 Claims**



Two non-magnetic tubes are journalled to a frame for rotation about a common axis which is transverse to the longitudinal axes of the two tubes. The tubes are rotated in opposite directions about their common axis by corresponding electric motors. Each tube has an electrical coil wound therearound and a ferro-magnetic mass slideably mounted therein. Each ferro-magnetic mass is normally urged outwardly in its tube by centrifugal force due to the rotation of the tube. A source of electrical energy is periodically coupled to the coils of each tube at a predetermined angular position of the tube in its cycle of rotation to abruptly oppose centrifugal movement of the ferro-magnetic mass therein, thereby generating a reaction force tending to impart motion to the frame.

3,790,873
GATE-CATHODE POWER SUPPLY FOR A CYCLOCONVERTER NETWORK OF SILICON CONTROLLED RECTIFIERS
Arthur L. Witten, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.
Filed May 29, 1973, Ser. No. 364,886
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **3 Claims**



A gate-cathode power supply for the silicon controlled rectifiers of a cycloconverter network, through which the phase windings of a three-phase alternating current motor may be cyclically energized by a source of three-phase alternating current motor supply potential, of the type having three common anode and three common cathode silicon controlled rectifiers for each phase of the motor supply potential arranged in groups of three common anode silicon controlled rectifiers and groups of three common cathode silicon con-

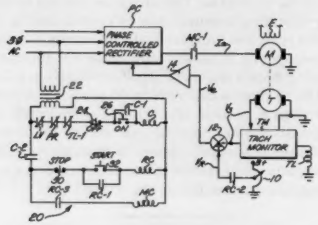
trolled rectifiers for each motor phase winding. The potential of each two phases of a three-phase alternating current gate-cathode power supply potential, each of the phases of which is in phase with the corresponding phase of the motor supply potential, are inverted, combined and rectified to produce three separate positive polarity direct current gate-cathode power potential pulses, each of which corresponds to the phase of the motor supply potential to which the other phase corresponds for each group of three common anode silicon controlled rectifiers and each two phases of the gate-cathode power supply potential are combined and rectified for producing three separate other positive polarity direct current gate-cathode power potential pulses, each of which corresponds to the phase of the motor supply potential to which the other phase corresponds for the three common cathode silicon controlled rectifiers for the phase of the motor supply potential to which it corresponds.

3,790,874

MOTOR DRIVE CONTROL SYSTEM

Robert G. Klimo, Parma, Ohio, assignor to Cleveland Machine Controls, Inc., Cleveland, Ohio

Filed July 27, 1972, Ser. No. 275,533
Int. Cl. H02p *5/00*; H02h *3/04*
U.S. Cl. 318—327 **19 Claims**



A motor drive control system for driving an electrical motor such that the motor speed is dependent upon an error signal representative of the difference between a desired or reference speed, and a speed signal provided by a DC tachometer generator. The tachometer generator is located in a feedback loop for providing a DC signal having a magnitude that varies with motor speed. A monitoring circuit serves to monitor electrical characteristics of the tachometer generator for purposes of preventing energization of the motor in the event of an unwanted electrical characteristic taking place in the tachometer generator feedback loop. The unwanted characteristic may be an improper connection of the tachometer generator in the feedback loop or a faulty tachometer generator, such as shorted armature windings or an open circuit condition between the tachometer brushes.

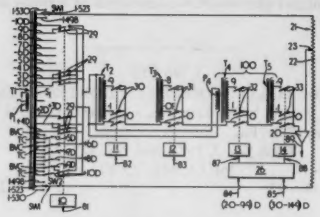
3,790,875

DIGITAL TO ANALOGUE CONVERTER

Robert Trevor Craxton, Rugby, England, assignor to Autoflow Engineering Limited, Rugby, England

Filed Nov. 24, 1971, Ser. No. 201,747
Int. Cl. G05b *11/14*
U.S. Cl. 318—573 **9 Claims**

A lens generating machine is provided with electrical digital to analogue converters for controlling various functions of the machine, the converters each including a specially-wound transformer provided on a secondary winding thereof with tapping points corresponding to digital control instructions concerning various lens optical parameters associated with said machine functions, operation of the machine being controlled through switch means for selectively effecting connection to said tappings to make available voltages which are the analogue equivalents of the corresponding control instructions and which are utilised to effect the necessary machine



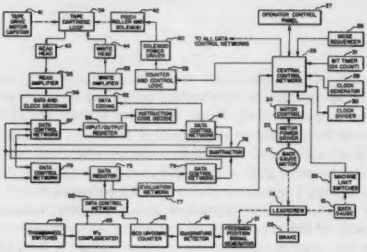
functions to produce a lens with the desired optical characteristics, for example, a toric lens.

3,790,876

PAPER CUTTING MACHINE

Robert W. Vail, Newport Beach, Calif., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 15, 1973, Ser. No. 332,732
Int. Cl. G05b *19/28*
U.S. Cl. 318—603 **4 Claims**



An improved paper cutting machine is provided with a novel servo control system for repeatedly, precisely positioning the machine movable backgauge assembly at different intermediate positions in its total length of traverse. The control system utilizes conventional command signals and also feedback signals which provide binary-coded position information associated only with key control positions established at selected intervals in the backgauge total traverse and pulsed counting information for incremental position changes in each interval between the key control positions.

3,790,877

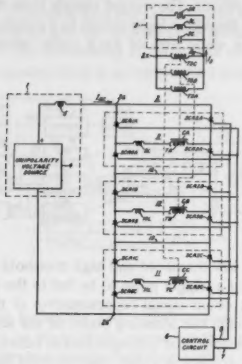
POWER DELIVERY SYSTEM FOR A TANK LOAD CHARACTERIZED BY SERIES-CONNECTED INVERTER BRIDGES AND A HIGH VOLTAGE SOURCE

Ronald B. Bailey, Waynesboro, Va., assignor to General Electric Company, Philadelphia, Pa.

Filed Feb. 2, 1973, Ser. No. 328,893
Int. Cl. H02m *7/00*
U.S. Cl. 321—27 R **2 Claims**

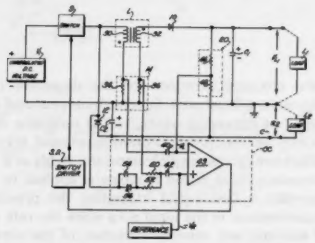
Electric power conversion apparatus, including series-connected current-source inverter bridges, safely delivers alternating current to a tank load from a source of unipolarity voltage of relatively high magnitude. Each inverter bridge comprises at least one pair of alternately conducting thyristors and a separate transformer. The secondary windings of the respective transformers are connected in parallel with one another to the load, and the inverter bridges are connected in series with

each other and with a current smoothing reactor to the source of high voltage which is divided among the bridges. The



source voltage can therefore be higher than the individual voltage handling capacity of the thyristors.

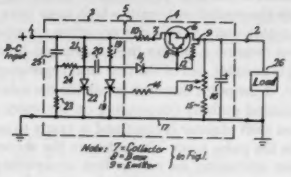
3,790,878
SWITCHING REGULATOR HAVING IMPROVED CONTROL CIRCUITING
Adrian Paul Brokaw, Woburn, Mass., assignor to Keithley Instruments Inc., Solon, Ohio
Filed Dec. 22, 1971, Ser. No. 210,999
Int. Cl. G05f *1/20*
U.S. Cl. 323—17 **29 Claims**



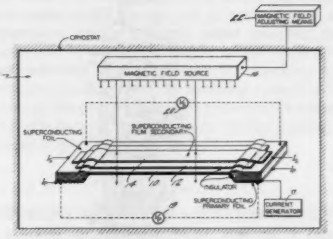
An electrical circuit particularly applicable for use as a switching regulator having a storage inductor which periodically receives energy from a D.C. voltage source through a switch. Energy is released from the inductor when the switch is off to supply a load circuit. The ratio of switch on time to switch off time is controlled in dependence upon changes in the amount of supplied energizing current and the released inductor current.

3,790,879
SWITCHING VOLTAGE REGULATOR
Slavko Milovancevic, P.O. Box 402, Torrance, Calif.
Filed Nov. 12, 1971, Ser. No. 198,311
Int. Cl. G05f *1/56*
U.S. Cl. 323—22 T **3 Claims**

A switching voltage regulator for providing constant voltage to a load from an unregulated d-c source of any form, employing a series control transistor whose on and off state is controlled by a modified static switch either directly, or through a transistor driver stage. The modified static switch serves also the purpose of sensing the output voltage magnitude and initiating the conduction of said control transistor, when the same is supplied with an input d-c voltage.

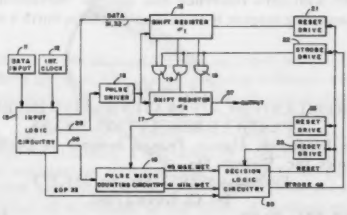


3,790,880
VARIABLE COUPLING DC SUPERCONDUCTING TRANSFORMER
Peter R. Solomon, Bloomfield, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Jan. 9, 1967, Ser. No. 608,175
Int. Cl. G05f *7/00;* **H01f** *10/00*
U.S. Cl. 323—44 F **2 Claims**



A dc transformer consisting of two Type I superconducting strips separated by an insulating layer, the assembly being situated in a magnetic field and cooled below the transition temperature of the superconductors. The coupling between the primary and secondary may be varied by varying the strength of the magnetic field.

3,790,881
PULSE WIDTH SELECTOR
David K. Smith, Beltsville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation of Ser. No. 200,777, Nov. 22, 1971, abandoned.
This application Mar. 6, 1973, Ser. No. 338,494
Int. Cl. H03k *5/20*
U.S. Cl. 328—112 **9 Claims**



An apparatus for accepting or rejecting pulses on the basis of pulse duration. Each pulse in an incoming pulse train is

clocked into a first shift register, while a counter records the duration of the pulse. When the end of the pulse is recognized, the counter is checked to establish whether the pulse duration is within the predefined limits which have been established by the operator and set into the counting circuitry. If the pulse duration (width) is within the established limits, the pulse is shifted in parallel, out of the first shift register to a second shift register. If the pulse duration is outside the established limit, it is eliminated entirely (depending on the mode of operation). The first shift register is reset and is ready to receive the next pulse in the pulse train. The pulses in the second shift register are then shifted to an output line completing the selection process.

3,790,882

DIP MAGNET MAGNETOMETER HAVING A DAMPED PENDULOUS SUPPORT AND TEMPERATURE COMPENSATION

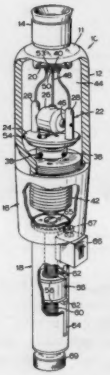
Edgar John Sharpe, Willowdale, Ontario, Canada, assignor to Coniagas Research Inc., Toronto, Ontario, Canada

Filed Jan. 8, 1973, Ser. No. 321,759

Claims priority, application Canada, Nov. 30, 1972, 158009

Int. Cl. G01r *33/02*

U.S. Cl. 324—48 **5 Claims**



This invention relates to a magnetometer having a dip magnet housing pivotally mounted on a damping base in a chamber filled with damping fluid. The damping base has an index means which has a zero reference line that overlies the locus of the end of a pointer carried by the dip magnet housing and the locus of the end of the pointer carried by the dip magnet housing has a direction that traverses the zero reference line. A viewing system overlies the index means and has a field of view that includes the zero reference line and the locus of the end of the pointer. A dip compensating magnet is adjusted as to position to rotate the dip magnet housing to align the pointer with zero reference line and the movement of the compensating magnet is an indication of the earth's magnetic field.

3,790,883

PARTICLE STUDY APPARATUS HAVING IMPROVED PARTICLE RESOLUTION MEANS

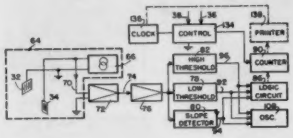
Pierre Bergegere, Aignan, France, assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed May 9, 1972, Ser. No. 251,773

Int. Cl. G01n *27/00*

U.S. Cl. 324—71 CP **14 Claims**

Electronic particle study apparatus of the Coulter type having a sensing zone arrangement wherein pulses are generated by particles in liquid suspension passing through the scanning ambit of a minute scanning aperture of said arrangement. Particle resolution means are provided which includes a low threshold level detector circuit, a high threshold level detector circuit, and a positive slope detector circuit including a differentiating circuit. The output signals from the detector circuits are fed through a logic circuit to a counter circuit so that each positive slope end of each pulse whose amplitude is



between the low threshold and high threshold enables a signal in the form of a trigger pulse to be fed to the counting circuit to register a count signal representative of the passage of a particle through the scanning ambit of the scanning aperture to enable resolution or distinguishment between two particles following each other at a short time interval therebetween.

3,790,884

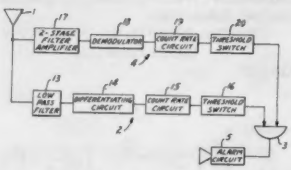
SEVERE THUNDERSTORM DETECTOR

Douglas A. Kohl, 417 Sixth Ave. N.E., Osseo, Minn.

Filed Aug. 2, 1972, Ser. No. 277,473

Int. Cl. G01w *1/00*

U.S. Cl. 324—72 **16 Claims**



Electrical circuitry provides for the detection of severe thunderstorms in a local area. Severe thunderstorms are those accompanied by damaging winds, hail or tornados. An antenna, which may be directional or omnidirectional, is used to detect the electromagnetic and electrostatic fields at a location. The electrostatic field at the location is applied to a circuit which provides a first signal indicating the presence of a severe thunderstorm in the local area when the rate of occurrence of maxima and minima variation of the electrostatic field exceeds a predetermined level. The electromagnetic field is applied to a second circuit which serves to provide a second signal when the variations in the electromagnetic field indicate the presence in the local area of any thunderstorm. Concurrence of the first and second signals is required to activate an alarm.

3,790,885

SERIAL TEST PATTERNS FOR MOSFET TESTING

Randell Leland James, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

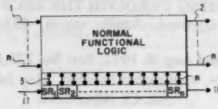
Filed Mar. 27, 1972, Ser. No. 238,268

Int. Cl. G01r *15/12*

U.S. Cl. 324—73 R **9 Claims**

A technique of decreasing the number of test patterns required to test a MOSFET module and/or provide the ability to test elements on the module which can not be tested by conventional test techniques. Conventionally, test patterns are applied to the input pins of a MOSFET module and the output monitored at the output pins of the module. Interwoven with the normal test pattern testing is the application of a serial test

pattern to selected elements on the module. The serial test pattern is applied to a single input pin on the module and a serial test pattern is stored in a shift register which is on the module. Each of the stages of the shift register are used to control or monitor an element or point which may be otherwise inaccessible or untestable and the shift register is also utilized in an output mode to provide an indication serially on a single output pin as to the functioning of the points accessed on the module. The sequence then is to input onto a single input pin a



serial test pattern for testing, controlling or monitoring various elements or nets on the module; reload the shift register in accordance with the test results; and then serially shift the contents of the shift register out onto the single output pin while monitoring this output to determine whether the elements or nets are functioning properly. In addition, while the serial test pattern is applied the output appearing at the output pins of the module may be monitored.

3,790,886

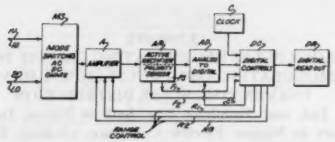
ELECTRICAL MEASUREMENT INSTRUMENT HAVING AN IMPROVED ANALOG TO DIGITAL CONVERTER

Stephen Kurtin; Michael Anthony, both of Pasadena, and Willis Watrous, Saratoga, all of Calif., assignors to Keithley Instruments, Inc., Solon, Ohio

Filed Oct. 4, 1971, Ser. No. 186,006

Int. Cl. G01r *17/06*; **H03k** *13/10*

U.S. Cl. 324—99 D **21 Claims**



An electrical measuring instrument is disclosed which may be used for measuring the magnitude of an unknown source, such as the magnitude of an A.C. signal, or the magnitude and polarity of a D.C. signal, or the resistance of a resistor. A voltage signal is developed having a magnitude dependent on the unknown source and this signal is applied to an analog to digital converter which employs a capacitor, a charging circuit and a discharging circuit. The capacitor charges at a rate dependent on the magnitude of the voltage signal. The stored energy crosses a given level and, then, in response to a clock pulse the capacitor is discharged at a known rate. The capacitor discharges through a particular level and the charging operation is thereafter commenced in response to another clock pulse. Counter and logic circuitry serve to provide an output indication of the magnitude of the unknown source as a function of a relationship of the number of clock pulses occurring during the discharge operations and a fixed number of clock pulses. Autoranging circuitry serves to sequentially uprange and downrange the scaling of the magnitude of an input signal prior to being applied to the analog to digital conversion circuitry. Other features are disclosed.

3,790,887

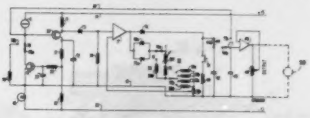
AMPLIFYING AND HOLDING MEASUREMENT CIRCUIT

Theodore A. Rich, Schenectady, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Division of Ser. No. 840,775, July 10, 1969, Pat. No. 3,664,740. This application Dec. 3, 1971, Ser. No. 204,471

Int. Cl. G01r *15/08, 19/16*

U.S. Cl. 324—111 **1 Claim**



A measure and hold amplifying circuit comprised by a sampling capacitor and a holding capacitor and first and second switches for transferring an amplified output signal to be measured from the output of a preamplifier to the sampling capacitor and thereafter to the holding capacitor with the holding capacitor being connectible across the input of a field effect transistor operational amplifier whose output supplies a suitable indicating meter. The holding and measuring amplifying circuit further includes a discharge resistor that intermittently is connected in circuit relationship across the sampling capacitor for sequentially discharging it intermediate each sampling operation, and a properly poled coupling diode which is connected between the output of the preamplifier and the first switching device whereby the blocking diode blocks reverse current flow from the sampling capacitor back into the output of the preamplifier and prevents the sampling capacitor and discharging resistor from unduly loading the output of the preamplifier.

3,790,888

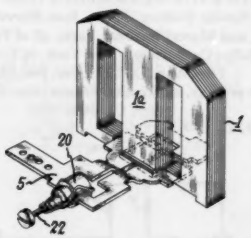
LAG ADJUSTMENT MEANS FOR A WATTHOUR METER

William H. Morong, Jr., Durham, N.H., assignor to General Electric Company

Filed Oct. 6, 1972, Ser. No. 295,449

Int. Cl. G01r *11/02*

U.S. Cl. 324—138 **15 Claims**

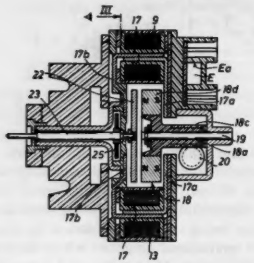


A watthour meter is provided with an improved reactor assembly for a lag plate. The reactor assembly is linearly adjustable to selectively and precisely vary the inductance of the lag plate so that its lag effect on the meter performance can be accurately, and reversibly, adjusted. This linearity of adjustment is afforded by mounting a flux-shunting adjustable screw in threaded engagement with opposite sides of an air gap in a reactor that has a flux path of varied cross-section parallel to the direction of movement of the screw. A resilient holding means is used to mount the screw for movement in a direction transverse to the magnetic field induced in the reactor by the lag plate.

3,790,889
EDDY CURRENT SPEEDOMETER

Antonio Mincuzzi, Milano, Italy, assignor to Societe Internationale De Mecanique Industrielle S. A., Luxembourg, Luxembourg

Filed June 19, 1972, Ser. No. 263,869
Claims priority, application France, June 17, 1971, 71.22062
Int. Cl. H02k *49/04*
U.S. Cl. 324—167 **1 Claim**

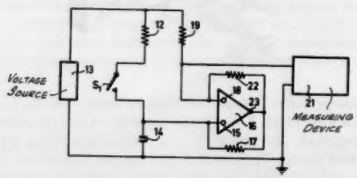


A counter, for example a counter-speedometer for automobile vehicles, comprising a motion take-off actuating a signal emitter and a receiving unit comprising a rotary magnet which drives, by the effect of Foucault's currents, a non-magnetic movable element integral with an index and subjected to the action of a return spring, a rotating field generator driving in synchronism said rotary magnet and supplied with power by said signal emitter, wherein the rotating field generator is constituted by at least one stator winding having at least one core terminating in pole pieces which encompass therebetween the rotary magnet and the non-magnetic element, said non-magnetic element being a disc rotating coaxially with the rotary magnet which is constituted by at least one elementary magnet oriented axially, and said pole pieces being disposed in such manner that the lines of force therebetween are also parallel to said common axis.

3,790,890
DEVICE FOR MEASURING A TIME INTERVAL

Francois-Xavier Doittau, Paris; Jean-Pierre Ythier, Maisons-Alfort, and Marcel Herbert, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1972, Ser. No. 243,564
Claims priority, application France, Apr. 20, 1971, 7113938
Int. Cl. G04f *9/00*
U.S. Cl. 324—189 **10 Claims**

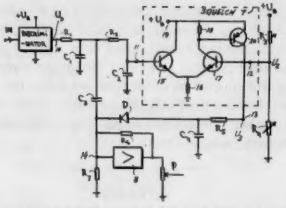


Device for measuring a time interval which comprises a capacitor which is charged during a first time interval and is discharged during a second time interval and also comprises two resistors which are connected to the inputs of an operational amplifier and to the capacitor in a manner such that the ratio between the charge and the discharge times is proportional to the ratio between the values of the resistors. By making this resistance ratio one to ten thousand short time intervals in the nanosecond range may be converted into time intervals which lie in the microsecond or millisecond range and hence can be measured with a higher degree of accuracy.

3,790,891
RECEIVER FOR A FREQUENCY-MODULATED ELECTRO-ACOUSTICAL SIGNAL HAVING SQUELCH MEANS FOR SUPPRESSING NOISE WHEN NO SIGNAL IS COMING THROUGH THE RECEIVER

Sven William Bjelvert, Anells vag 6, 633 69, Eskilstuna, Sweden

Filed Aug. 8, 1972, Ser. No. 278,814
Claims priority, application Sweden, May 24, 1972, 6730/72
Int. Cl. H04b *1/10*
U.S. Cl. 325—348 **3 Claims**

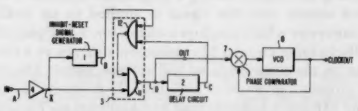


The invention relates to a receiver for a frequency-modulated electro-acoustical signal system and more particularly to a compression wave transmission system having a receiver which is adapted to suppress noise signals of frequencies other than the frequencies of the electro-acoustical frequencies, only during periods when no electro-acoustical or compression wave frequency is received. The receiver according to the invention is especially suitable for use in a wireless diver communication system for ultrasonic voice transmission.

3,790,892
CLOCK PULSE REGENERATING CIRCUIT FOR DEMODULATING INPUT PULSE SIGNAL HAVING UNEVEN TIME PULSE DISTRIBUTION

Yoichi Tan, and Toshihiko Ryu, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo-to, Japan

Filed May 18, 1972, Ser. No. 254,723
Claims priority, application Japan, May 24, 1971, 46/34774
Int. Cl. H03k *5/18*
U.S. Cl. 328—120 **4 Claims**



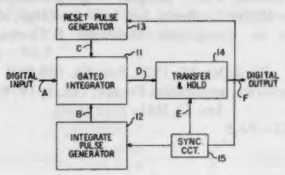
A clock pulse regenerating circuit for stably extracting clock pulses from a signal pulse train having an uneven pulse distribution in the time domain. The regenerating circuit includes circuitry for generating auxiliary clock pulses corresponding to recycled previously extracted clock pulses when the signal pulse train lacks pulses for a predetermined time interval.

3,790,893

SAMPLE AND HOLD CIRCUIT FOR DIGITAL SIGNALS

Walter Leo Corwin, Freehold, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 16, 1972, Ser. No. 307,034
Int. Cl. H03k 5/00
U.S. Cl. 328—151 7 Claims



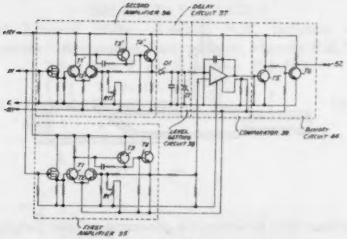
A sample and hold circuit wherein the digital signal to be sampled is differentially applied to a pair of gated transistors. Once during each time slot, the transistor pair is gated to provide a sampling aperture during which an integration of the digital signal is performed. The results of each integration are evaluated to determine whether a pulse (or a space) occurred in the digital signal during the time slot.

3,790,894

BINARY SHAPING CIRCUIT

Yoshio Iizuka, Yokohama, and Tetsuro Morita, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 23, 1971, Ser. No. 211,524
Claims priority, application Japan, Dec. 30, 1970, 45/122223
Int. Cl. H03k 5/18, 5/08, 5/156
U.S. Cl. 328—164 3 Claims



A level setting circuit changes the level of the input signals to a predetermined reference level when the input signals exceed the reference level. A comparator is connected to the level setting circuit and to the input for comparing the input signals with the signals having the reference level produced by the level setting circuit. The comparator produces an output corresponding to the difference in level between the input signals and the reference level. A binary circuit connected to the comparator produces a pulse when the output of the comparator exceeds a predetermined level.

ERRATUM

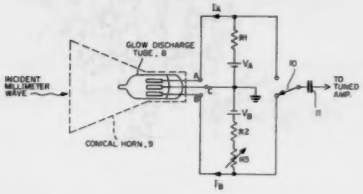
For Class 328—112 see:
Patent No. 3,790,881

3,790,895

GLOW DISCHARGE MILLIMETER WAVE DETECTOR AND METHOD OF BIASING SAME

Nabil H. Farhat, Philadelphia, Pa., and Norman S. Kopeika, Kfar Haroe, Israel, assignors to University of Pennsylvania, Philadelphia, Pa.

Filed Oct. 19, 1972, Ser. No. 299,002
Int. Cl. H01j 17/36; H03d 1/00
U.S. Cl. 329—157 8 Claims



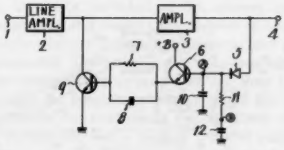
A millimeter wave glow discharge detector biased to achieve an improvement in signal to noise ratio of about 20 dB. The glow discharge detector tube comprises three or more electrodes, including an anode biased with respect to a cathode so as to generate a first discharge current which forms a high density plasma of electrons in a specific region of the tube, and a sensing electrode positioned with respect to the cathode such that it is affected by the area of high electron density, and biased to draw a relatively small second discharge current. Incident millimeter wave radiation interacts with electrons in the plasma region of the tube, resulting in changes in the second discharge current and the voltage at the sensing electrode.

3,790,896

AUTOMATIC GAIN CONTROL CIRCUIT

Kunio Shimizu, Tokyo; Isao Tamaki, Yokohama, and Noriyuki Yamashita, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 5, 1973, Ser. No. 321,239
Claims priority, application Japan, Jan. 11, 1972, 47/5395; Aug. 7, 1972, 47/78889
Int. Cl. H03g 3/30, 3/20
U.S. Cl. 330—29 19 Claims



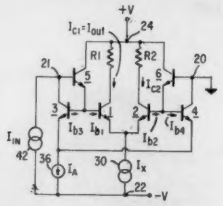
An automatic gain control circuit particularly desirable for use in a magnetic recording and/or reproducing apparatus includes a variable impedance element interposed in a signal shunt path to control the gain in accordance with the impedance of such element which is varied by a control signal from a plurality of capacitor charging circuits having different time constants and being supplied with the output of a rectifier for the received signal. The arrangement is such that the automatic gain control function is made dependent on the time duration of the received signal level, that is a short recovery time is provided for restoration of the original gain when an impulse or noise of short duration and high level is received, and a relatively long recovery time is otherwise provided for increasing the dynamic range of the output signal.

3,790,897

DIFFERENTIAL AMPLIFIER AND BIAS CIRCUIT

Carl Franklin Wheatley, Jr., Somerset County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 5, 1971, Ser. No. 130,974
Int. Cl. H03f *3/68*
U.S. Cl. 330—30 D **10 Claims**



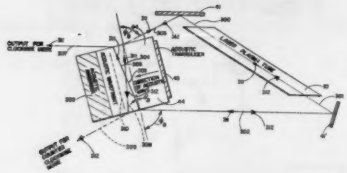
Differential amplifier having reduced static and cross modulation errors. The amplifier includes first and second pairs of transistors, the emitters of each pair being connected to first and second current sources, respectively. A first additional transistor is connected at its emitter to the base of one transistor from each pair and at its base to the collector of one transistor from the first pair for forming a first input terminal. A second additional transistor is connected at its emitter to the base of the remaining transistors from each pair and at its base to the collector of the other transistor from the first pair for forming a second input terminal. A current signal is applied across the input terminals for controlling the subdivision of the current from the first current source between the two transistors of the first pair thereby controlling the subdivision of the current from the second current source between the two transistors of the second pair.

3,790,898

SELECTIVELY TUNABLE GASEOUS LASER

Richard A. Gudmundsen, Santa Ana, and James E. Rau, Anaheim, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 837,249, June 27, 1969, Pat. No. 3,624,551. This application July 12, 1971, Ser. No. 161,583
Int. Cl. H01s *3/08, 3/10*
U.S. Cl. 331—94.5 **12 Claims**



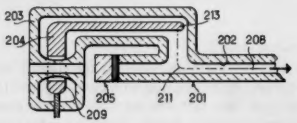
The invention relates to a laser device which comprises in combination laser generation means including a laser cavity which has a gaseous medium in at least a portion of the cavity and which produces directed energy comprised of a group of frequency bands. Also included are apparatuses which react with the directed energy, so designed so as to avoid translation and angular rotation of the directed energy. The apparatuses provide selective tuning of the laser cavity to at least one of the frequency bands. Included are equipments for programming the apparatuses so that the laser is tuned to either one of the frequency bands, to all of the frequency bands in a predetermined sequence, or to some of the frequency bands in a random access manner. An additional component interposed in the path of the directed energy beam enables the laser beam to act as a carrier of the electrical signals provided by this additional component.

3,790,899

DISCHARGE TUBE

Benjamin Dessus, Paris; Jacques Migne, Bretigny-sur-Orge, and Jean-Michel Catherin, Sav Igny-sur-Orge, all of France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Oct. 12, 1971, Ser. No. 188,060
Claims priority, application France, Oct. 9, 1970, 7036591
Int. Cl. H01s *3/22, 3/02*
U.S. Cl. 331—94.5 **1 Claim**



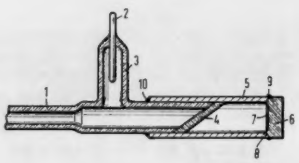
A discharge tube which includes two electrodes, one at each end of the tube, for producing a potential barrier to urge charged particles from the end of the tube towards the discharge region of the tube. The electrodes are separated from the interior of the tube by a dielectric layer.

3,790,900

GAS LASER MIRROR ASSEMBLY

Hans Golser, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 848,322, Aug. 7, 1969, abandoned. This application Nov. 29, 1971, Ser. No. 203,018
Int. Cl. H01s *3/02, 3/22, 3/05*
U.S. Cl. 331—94.5 **3 Claims**



A gas laser tube structure for generating a laser output comprising an elongated, evacuated envelope containing a gas suitable for producing a glow discharge with the closed ends of said envelope being made non-reflective by cutting them at Brewster's angle, hollow tubular members fixed at each end of said envelope, and reflective mirrors attached to the other end of said tubular members which define a resonant cavity of gas-tight construction.

The gas laser preferably contains a gas in the resonant cavity which does not absorb the laser radiation and the reflective mirrors prior to sealing are adjustable with respect to the tubular member whereby optimum laser output is achieved. Also covers a method of making said gas laser tube structure by providing said envelope with a gas and closing it at its ends, placing around the non-reflective ends of said envelope a tubular member in a fixed manner, energizing the laser tube, fixing an end-piece containing a reflective surface to the other end of said tubular member during the energizing step, adjusting the end-piece with its reflective surface until maximum

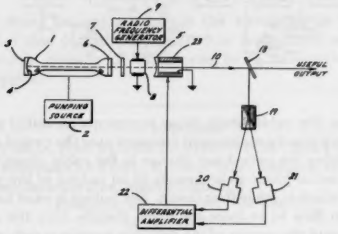
laser output is reached and then sealing said end-piece in properly adjusted condition to said tubular member in a gas-tight manner.

3,790,901

ELECTRO-OPTICALLY INDUCED WEAK COUPLING OF ADJACENT CARBON DIOXIDE LASER MODES

Matthew B. White, Newport Beach, and Wesley Duane Gerber, Santa Ana, both of Calif., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed Mar. 22, 1972, Ser. No. 237,038
Int. Cl. H01s 3/10
U.S. Cl. 331—94.5 ' 9 Claims



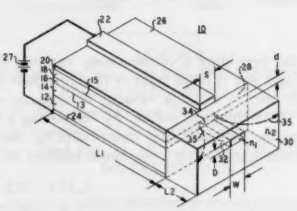
A low level polarization modulation is applied to a carbon dioxide dual-polarization laser. The modulation frequency is approximately equal to the difference in frequency between allowed orthogonally polarized adjacent laser modes. This modulation insures dual-polarization operation in the carbon dioxide laser, which, in the absence of such modulation, will only oscillate in one mode. Adjacent mode coupling is ordinarily so strong that the oscillating mode suppresses the adjacent mode. Since the polarization modulation offsets the adjacent mode coupling it is called electro-optically induced weak coupling or EIWC.

3,790,902

FUNDAMENTAL TRANSVERSE MODE OPERATION IN SOLID STATE LASERS

Stewart Edward Miller, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 5, 1972, Ser. No. 286,282
Int. Cl. G02f 3/00
U.S. Cl. 331—94.5 C 10 Claims



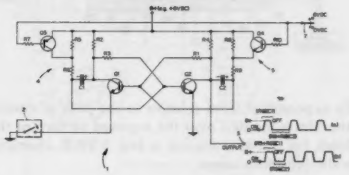
Fundamental transverse mode operation is achieved in a monolithic laser structure comprising an intracavity passive waveguide portion, which is capable of supporting only the fundamental transverse mode, arranged in tandem with the laser active medium, which typically would oscillate in a plurality of transverse modes. Particular embodiments are described for double heterostructure junction lasers.

3,790,903

TRANSISTOR MULTIVIBRATOR SWITCHABLE BETWEEN TWO RATIOS OF OFF/ON PULSE TIMES

Allen F. Hillman, Jr., Muncy, Pa., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 4, 1972, Ser. No. 311,930
Int. Cl. H03k 3/282
U.S. Cl. 331—113 R 9 Claims



A dual-rate free-running multivibrator circuit for producing trains of output pulses having different ratios of off/on pulse times. The multivibrator circuit includes first and second transistors and respective first and second capacitors arranged for operation in a conventional multivibrator fashion, and first and second variable-resistance arrangements respectively connected to the first and second capacitors for achieving variable RC time constants for establishing first and second sets of off and on times for the first and second transistors. Each of the variable-resistance arrangements includes first and second resistors connected in series with the associated capacitor and a transistor connected in parallel with the first resistor.

To operate the dual-rate multivibrator circuit to produce a train of output pulses having a first ratio of off/on pulse times, a control voltage having a predetermined first value is applied to the transistor included in the first variable-resistance arrangement and causes the transistor to operate in its conducting state whereby it shunts the first resistor connected in parallel therewith. The transistor in the other (second) variable-resistance arrangement operates at this time in its non-conducting state. As a result, a first set of RC time constants is established for controlling the operation of the first and second transistors, and a first train of output pulses having a first ratio of off/on pulse times is produced at an output terminal connected to the second transistor. To produce a train of output pulses having a second ratio of off/on pulse times, a control voltage having a predetermined second value is applied to the transistor included in the second variable-resistance arrangement and causes the transistor to operate in its conducting state whereby it shunts the first resistor connected in parallel therewith. The transistor in the other (first) variable-resistance arrangement operates at this time in its non-conducting state. As a result, a second set of RC time constants is established for controlling the operation of the first and second transistors, and a second train of output pulses having a second ratio of off/on pulse times is produced at the output terminal.

3,790,904

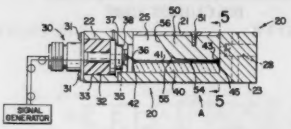
RF TERMINATION

Leo Lesyk, Walton Hills, and David A. Kaltenborn, Ravenna, both of Ohio, assignors to Bird Electronics Corporation, Salon, Ohio

Filed Mar. 19, 1973, Ser. No. 342,784
Int. Cl. H01p 1/26
U.S. Cl. 333—22 R 6 Claims

A conduction-cooled load or termination for an RF coaxial transmission line. A flat film resistor coated onto a dielectric substrate of high thermal conductivity is series-connected between the coaxial conductors to convert electrical energy

into heat energy. The heat energy is rapidly conducted through the substrate to the body of the termination which is in turn, attached in heat transfer relationship to an appropriate heat sink. A shaker with a composite surface of



generally exponential form relative to the path of conduction across the film is located over the exposed surface of the film to establish for the termination a low VSWR characteristic over a wide frequency range.

3,790,905

WAVEGUIDE FOR SIMULTANEOUSLY TRANSMITTING TWO ELECTROMAGNETIC WAVES

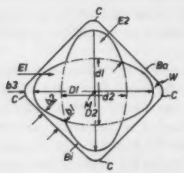
Erich Schuttloffel, Backnang, Germany, assignor to Licentia Patent Verwaltungs-GmbH, Frankfurt, Germany

Filed Nov. 24, 1971, Ser. No. 201,661

Claims priority, application Germany, Dec. 3, 1970, P 20 59 494.9

Int. Cl. H01p *3/12, 3/14*

U.S. Cl. 333—95 A **8 Claims**



A flexible waveguide for the simultaneous transmission of two perpendicularly disposed linearly polarized electromagnetic waves. The waveguide is in the form of a hollow, elongated, thin-walled flexible metal body which has a constant cross-sectional profile along its longitudinal axis. The outer periphery of the cross-sectional profile is approximately quadratic with rounded corners and constitutes a continuous smooth curve free of abrupt changes in slope. The inner periphery of the cross-sectional profile defines the cross section of a longitudinally extending recess. The cross section of the recess is in the form of two, overlapping, identical ellipses having major axes which are perpendicular to one another.

3,790,906

SYSTEM FOR STABILIZING CABLE PHASE DELAY UTILIZING A COAXIAL CABLE UNDER PRESSURE

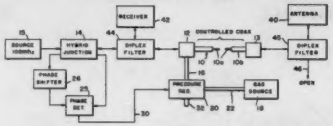
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Philip A. Clements, La Crescenta, Calif.

Filed Feb. 23, 1973, Ser. No. 335,201

Int. Cl. H04b *3/10*

U.S. Cl. 333—16 **10 Claims**

A system for stabilizing the phase delay of signals passing through a pressurizable coaxial cable is disclosed. Signals from an appropriate source at a selected frequency, e.g., 100 MHz, are sent through the controlled cable from a first cable end to a second cable end which, electrically, is open or heavily mismatched at 100 MHz, thereby reflecting 100 MHz signals back to the first cable end. Thereat, the phase difference between the reflected-back signals and the signals from the source is detected by a phase detector. The output of the latter is used to control the flow of gas to or from the cable, thereby controlling the cable pressure, which in turn affects the cable phase delay. At the start of a period over which the cable phase delay is to be stabilized, the signals from the source which are supplied to the phase detector are phase shifted by a phase shifter until the detector's output is 0 volt, thereby inhibiting gas to flow either to or from the cable. Under these



conditions, the cable phase delay represents an initial phase delay which is to be maintained constant over the period of interest. During the period any change in the cable phase delay from the initial phase delay results in an output of the phase detector which is other than 0 volt. The output is used to control gas to flow to or from the cable thereby vary the cable pressure until the output of the detector is again 0 volt, which indicates that the cable phase delay is again equal to the initial phase delay.

3,790,907

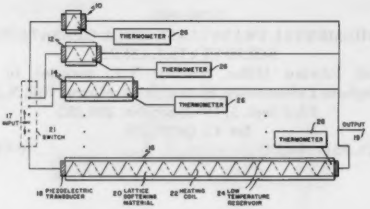
LATTICE SOFTENING VARIABLE DELAY LINE

Edward M. Alexander, College Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 30, 1973, Ser. No. 346,538

Int. Cl. H03h *7/20, 7/36, 9/30*

U.S. Cl. 333—30 R **18 Claims**



A device for providing a continuously variable delay for successive pulses in a rf pulse train or for individual pulses by using the principle of variable velocity of acoustic waves in materials in which phonons soften. By employing a series of phonon softening devices, each contributes to the desired total delay while introducing a minimum amount of attenuation.

3,790,908

HIGH POWER DIODE PHASE SHIFTER

Richard W. Burns, Orange, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

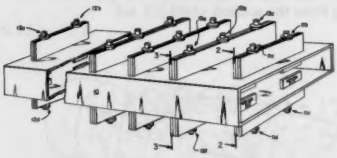
Filed Dec. 29, 1972, Ser. No. 319,271

Int. Cl. H03h *7/18*

U.S. Cl. 333—31 A **11 Claims**

A voltage-controlled phase shifter of the loaded-line type is disclosed employing arrays of diode switches coupled to probes in quarter wavelength spaced planes of a rectangular

waveguide by stripline circuits. The strip-line circuits and probes are adjusted in design and position to give a small value of susceptance per diode in shunt with the waveguide. The



total shunt susceptance across the waveguide in the same plane is thus divided between two or more diode switches to achieve a division of the power being propagated in the waveguide.

3,790,909

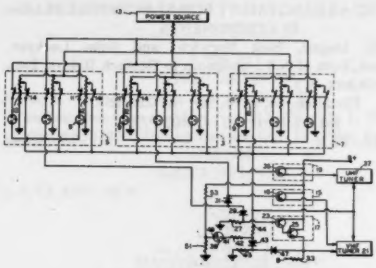
VARACTOR TUNER BAND SWITCH CIRCUITRY

Paul Eshelman Le Fevre, Pavilion, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Jan. 26, 1973, Ser. No. 326,758

Int. Cl. H03j *3/06*

U.S. Cl. 334—14 **9 Claims**



A signal receiver having VHF and UHF varactor tuners and a channel indicating group for the upper and lower VHF channels and for the UHF channel includes band switching circuitry for selectively coupling a plurality of power sources to the tuners in accordance with activation of a particular channel indicating group.

3,790,910

CONDITIONING CIRCUIT AND METHOD FOR VARIABLE FREQUENCY SENSOR

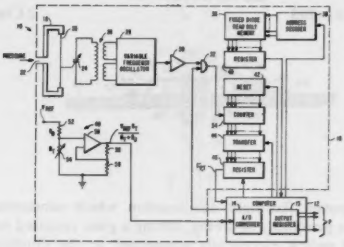
William H. McCormack, San Pedro, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 21, 1972, Ser. No. 246,471

Int. Cl. G06f *15/34*

U.S. Cl. 235—151.3 **19 Claims**

A conditioning circuit includes a computer connected to a pressure transducer having a variable frequency oscillator the output signal of which varies with pressure, a temperature sensor, a read only memory storing constants which are dependent upon the particular transducer and application, and a counter connected to count the variable frequency output signal when gated. In accordance with the disclosed method, the computer obtains a digital count signal indicative of oscillator frequency by gating the output signal to the counter for a predetermined interval, converts an analog signal from the temperature sensor to a digital signal, and then computes a linearized, temperature compensated digital pressure signal in accordance with a predetermined function which utilizes constants stored in the read only memory to initially scale and translate the count signal for maximum computer accuracy,



corrects for nonlinearities in the count signal, and corrects for variations in the count signal with temperature. The computed signal then appears at the output as a binary digital word accurately representing sensed pressure over a wide range.

3,790,911

ELECTRICAL CIRCUIT-BREAKER

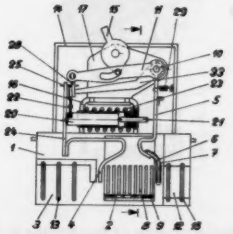
Hermann Kick, Schaffhausen, and Walter Schwyn, Beringen, both of Switzerland, assignors to Carl Maier & Cie, Schaffhausen, Switzerland

Filed Sept. 29, 1972, Ser. No. 293,453

Claims priority, application Switzerland, Sept. 30, 1971, 14378/71

Int. Cl. H01h *9/30*

U.S. Cl. 335—201 **8 Claims**



An electrical circuit-breaker having contacts with double rupturing, comprising two fixed contact members and at least one movable contact member. There is provided mechanism for actuating the movable contact member and including an armature which knocks away the movable contact member in case of short circuit, and two arc quenching chambers each having at least one gas outlet opening. Each quenching chamber is equipped with a U-shaped iron plate, the opening of the U facing towards the mechanism. According to the invention, the two arc quenching chambers are arranged along the two opposite sides of a separating wall of insulating material in a manner that the gas outlet opening of the chambers as well as the fixed contact members are separated mechanically and electrically by the wall, and the wall serves as a support for other structural parts of the breaker.

3,790,912

FLASHLIGHT AND SWITCH ASSEMBLY

John D. Murphy, 22 E. 22nd St., Bayonne, N.J.

Division of Ser. No. 210,791, Dec. 22, 1971, Continuation-in-part of Ser. No. 156,661, June 25, 1971, abandoned. This application Oct. 2, 1972, Ser. No. 293,922

Int. Cl. H01h *36/00*

U.S. Cl. 335—205 **2 Claims**

An improved flashlight construction which substantially reduces the possibility of arcing, having a glass enclosed magnetic reed switch electrically connected to the conductor strips along the wall of the flashlight case and having the magnet required to close the contact arms of the reed switch incorporated into a slidably mounted switch cover, the conductor strips being electrically connected in a fixed position between the conductor rings at the ends of the case. In a modified form of the switch assembly, the magnet is positioned in a preformed case which is mounted on the outside of the flashlight case so that the movable parts of the switch are completely separated from the internal parts of the flashlight. Other modifications of switch covers having magnets mounted therein which can be locked in either the "On" or "Off" position by means of magnetizable steel are also shown.

3,790,913

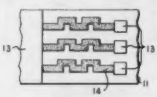
THIN FILM RESISTOR COMPRISING SPUTTERED ALLOY OF SILICON AND TANTALUM

Frank Groom Peters, 104 Stanley Ave., Nutley, N.J., and Newton Schwartz, 19 Skyline Dr., Morris Twp., Morris County, N.J.

Division of Ser. No. 268,588, July 3, 1972. This application Apr. 2, 1973, Ser. No. 347,228

Int. Cl. H01c *7/00*

U.S. Cl. 338—308 **1 Claim**



A thin film material capable of functioning as the anode in electrochemically formed thin film capacitors and as the resistive track in anodized resistors in thin film integrated circuits comprising a film of sputtered tantalum and silicon.

3,790,914

DOUBLE LOCK ELECTRIC PLUG

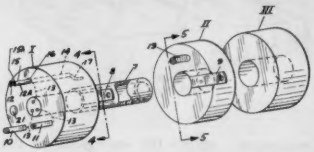
David S. Hough, 17055 Brewer Rd., Dundee, Mich.

Filed May 10, 1973, Ser. No. 358,887

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 P **5 Claims**

A cylindrical body of di-electric material, having an axial bore with an electric cable received therein, and comprising; a first ring, having on one face, a tubular axial extension, and having on the other face, three conductive prongs, including a ground prong, for being received in a conventional power outlet, said prongs being connected to the wires of said cable; a second ring rotatable on said extension and a third ring on said extension, which serves as a thrust bearing for the second ring and a retainer for said cable. The ground prong has a bifurcated, or split, outer wall in which lies a rotatable cam rod, which extends through the first ring and into a cam slot formed in the second ring. The cam rod has at one end a flat coin-like locking head, which when rotated in one direction, expands the walls of said ground prong to prevent withdrawal of the plug from the socket.



At the other end of said cam rod is a cam for axially rotating the said rod, when the second ring is rotated on the said axial extension. Each said first and second ring has a perforated tab thereon for receiving a padlock, to prevent rotation of the two rings, with respect to each other, when said cam rod is in locking position.

3,790,915

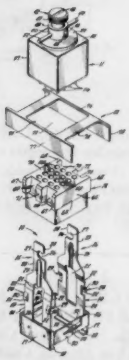
MOUNTING ARRANGEMENT FOR ELECTRICAL PLUG-IN COMPONENTS

Alanson G. Dugan, East Norwich, and John Lockyer, Smithtown, both of N.Y., assignors to Deutach Relays, Inc., East Northport, N.Y.

Filed Feb. 14, 1972, Ser. No. 225,957

Int. Cl. H01r *13/54*; **H02b** *1/02*

U.S. Cl. 339—88 R **15 Claims**



An arrangement for supporting electrical plug-in components which includes a mounting member defining an opening through which extend the opposed flexible walls of an attaching unit having a bottom portion which carries one component to be secured, this component having abutments to engage the undersurface of the mounting member, while tabs on the opposed walls engage the upper surface of the mounting member, the other component fitting between the opposed walls and having a spring-loaded, manually-operable, rotatable latching arrangement engaging the ends of the opposed walls to hold the other component in place.

3,790,916

EDGE MOUNT CONNECTOR TERMINAL

Gerald A. Keitel, Park Ridge, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 3, 1972, Ser. No. 277,714
Int. Cl. H01r 9/12
U.S. Cl. 339—95 R 9 Claims

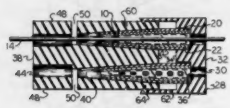
An edge mount connector terminal connectible to the edge portions of board-like substrates and engageable with edge mounted terminal pads. The connector terminal is comprised of a pair of oppositely disposed elongated jaw members commonly depending from a bight portion and insertable onto the edge portion of the substrate. One of the jaw members is generally greater in length than the other jaw member and has its free end portion serrated for anti-slippage contact with the terminal pad. The end portion is biased onto the terminal pad and has improved mechanical construction to permit improved solder attachment techniques. The one jaw member also engages the substrate other than at its free end portion in a location generally opposite from the area of engagement of the other jaw member with the substrate for providing stabilization of the connector terminal with respect to the substrate and the terminal pad.

3,790,917

STRIP METHOD

Jimmy C. Ray, Rt. 2, Box 28-D, Denison, Tex.

Continuation-in-part of Ser. No. 702,375, Feb. 1, 1968, Pat. No. 3,551,803. This application Oct. 28, 1968, Ser. No. 770,958
Int. Cl. H01r 9/08
U.S. Cl. 339—95 R 19 Claims



A wire from each of two communication cables to be spliced is inserted into a tang connector, which has a stiff plate above and below the connector. The tanged connector is one of many in a block. The connectors, each containing wire, are crimped by forcing each connector into a tapered hole, the plurality of tapered holes being located in a crimp block. After crimping the connectors, the excess wire is cut off by a cutter in a slot in the crimp block. The crimp block is left permanently attached to the connectors in the completed splice. The holes in the crimp block extend through the crimp block leaving the end of each connector exposed for future connections. A square pin extending from one of the stiff plates provides a pin for making a future connection.

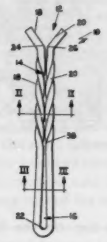
3,790,918

ELECTRICAL CONNECTOR

William C. Dauser, North Muskegon, Mich., assignor to Lloyd A. Heneveld, trustee of Dauser Trust IV, Grand Rapids, Mich.

Filed Jan. 21, 1972, Ser. No. 219,711
Int. Cl. H01r 9/08
U.S. Cl. 339—97 R 15 Claims

An insulation stripping, solderless electrical connector formed of a twisted length of wire-like resilient material having the lower U shaped portion forming a conductor-engaging pressure junction to securely hold the conductor therein. In one of its embodiments, the connector includes exposed twisted, sharpened portions at the upper or entrance portion



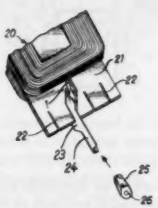
which cut and clean the insulation from a conductor. In another embodiment of the invention, the entrance portion or channel is provided with facing serrated edges to clean and strip the insulation from the conductor.

3,790,919

CONTACT PIECE FOR THE SOLDERLESS CONNECTION OF AN INSULATED ELECTRICAL CONDUCTOR AND METHOD OF USING SAME

Josef Landolt, Nafels, Switzerland, assignor to F. Knobel Elektro-Apparatebau AG, Ennenda, Switzerland

Filed Mar. 9, 1972, Ser. No. 233,144
Int. Cl. H01r 9/08
U.S. Cl. 339—97 P 4 Claims



A contact piece for the solderless connection of an insulated conductor comprising a contact piece body having at least two cooperating cutting or knife edges serving to fixedly clamp therebetween the insulated conductor while penetrating through the conductor insulation.

3,790,920

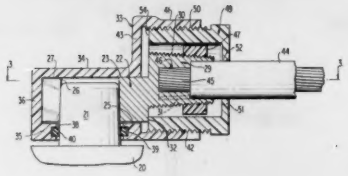
BATTERY TERMINAL CONNECTOR AND HOUSING

Richard R. Wening, Santa Ana, Calif., assignor to Wening Avionics, Inc., Santa Ana, Calif.

Filed Sept. 29, 1972, Ser. No. 293,334
Int. Cl. H01r 13/52
U.S. Cl. 339—116 C 11 Claims

A battery terminal post receives a split connector cap of compatible metal and the cap is firmly clamped to one end of a battery cable. A housing element for the battery terminal post and connector cap is sealed around the post in a fluid-tight manner. A threaded clamping or pressure sleeve is received in a threaded bore of the housing element and exerts

pressure on a rear face of the connector cap. The cap and interior of the housing element are configured to cause firm



clamping of the split cap on the battery terminal post in response to the pressure exerted by said sleeve.

3,790,921

ELECTRIC CONNECTING DEVICE FOR AN ENCASED REFRIGERATING MACHINE

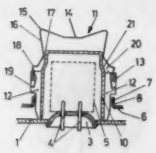
Erik Nielsen, and Hans Christian Pedersen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Nov. 12, 1971, Ser. No. 198,205

Claims priority, application Germany, Nov. 10, 1970, P 20 55 184.2

Int. Cl. H01r *13/54*

U.S. Cl. 339—75 R **2 Claims**



The invention relates to an electrical housing assembly for a refrigeration machine which attaches to the casing wall of the refrigeration machine. The housing assembly encloses a plug element which is mounted on insulated guide pins which extend through the casing wall. The housing assembly comprises a plastic box which surrounds the plug element and a U-shaped spring for attaching the cover to the casing wall. Attaching means for the spring include guide track elements having hooking edges which facilitate the easy snapping of the spring into and out of its attached position.

3,790,922

COUPLING FOR AN ELECTRICAL CONNECTOR

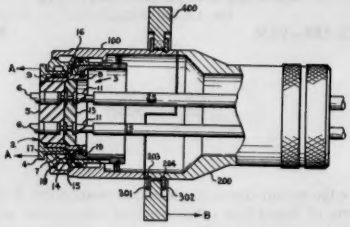
Richard W. Normann, Otego, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 8, 1972, Ser. No. 251,158

Int. Cl. H01r *13/46*

U.S. Cl. 339—126 R **6 Claims**

An easily disconnectable sleeve that houses one half of a quick release or emergency release type connector assembly. The rear portion of the sleeve may be removed for access to the junction between the electrical contacts of the connector and the incoming wires, thereby permitting the electrical circuitry to be checked without disconnecting the connector assembly. The rear portion of the sleeve is fixedly secured to the front portion of the sleeve by two snap rings and a coupling ring. Unlike a threaded coupling, this coupling is capable of



transmitting torque and resisting vibrations that would normally uncouple a threaded coupling.

3,790,923

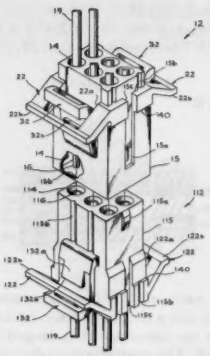
ELECTRICAL CONNECTOR HAVING IMPROVED PANEL MOUNTING MEANS AND AN IMPROVED RELEASABLE CONTACT CONSTRUCTION

Istvan Mathe, Cicero, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Apr. 4, 1972, Ser. No. 241,014

Int. Cl. H02b *1/02*

U.S. Cl. 339—128 **5 Claims**



An electrical connector having an improved panel mounting construction and an improved releasable contact construction. The improved panel mounting construction typically comprises first and second pairs of resilient wings provided on opposite sides of the housing. Each pair of wings comprises a resilient stop wing and a deflectable snap-in wing projecting through an aperture provided in the stop wing. The stop wing provides bearing surfaces for resiliently bearing against the entry side of a panel and the snap-in wing has a locking lip with bearing surfaces for resiliently bearing against the opposite side of the panel after being passed through a panel opening by inward deflection of the snap-in wing. The improved releasable contact construction provides for unusually reliable and rugged retention of a contact in its receiving cavity by the combined action of a deflectable retention tine provided on the contact operating on the principle of long beam deflection with respect to a retention shoulder in the cavity along with two additionally provided radially compressible retention flares operating on the principle of radial compression with respect to the same retention shoulder.

3,790,924
RELAY-PLUG-IN CONTACT SPRING

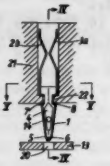
Hans Sauer, Deisenhofen, Germany, assignor to Matsushita Electric Works Ltd., Osaka, Japan

Filed May 8, 1972, Ser. No. 250,958

Claims priority, application Germany, May 21, 1971, P 21 25 169.4

Int. Cl. H01r *13/12*

U.S. Cl. 339—258 R **5 Claims**



A spring plate is cut and bent along a center axis to form at one end resilient portions for receiving a contact pin and at the other end a generally trough-shaped tapering connector portion adapted to be inserted into a hole of a conductor plate and provided with a converging opening for receiving a connecting wire.

3,790,925
ECHO-SOUNDING APPARATUS HAVING A DIGITAL INTERMEDIATE STORE

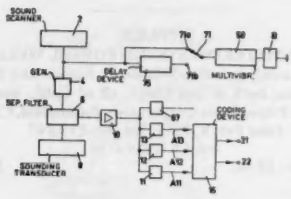
Erhard Ahrens, Kiel, Germany, assignor to Electroacustic GmbH, Kiel, Germany

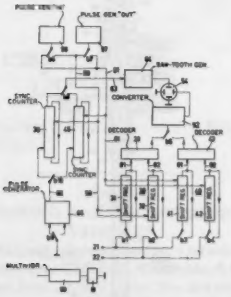
Filed June 19, 1970, Ser. No. 47,770

Claims priority, application Germany, June 26, 1969, P 19 32 346.7

Int. Cl. G01s *9/68*

U.S. Cl. 340—3 R **6 Claims**





This invention relates to echo-sounding apparatus of the kind employing at least one digital intermediate store and an indicating apparatus, and in which echo signals that arise within a sounding period and which form echo information, are read into the intermediate store and are subsequently interrogated or read out of this store and then fed to the indicating apparatus. In order to remove the defects attendant upon hitherto usual digital intermediate stores, the invention provides at least one timing pulse generator which is associated with the intermediate store and is operable at a selected frequency or, alternatively, at least two timing pulse generators are provided that operate at different pulse frequencies: in either case the intermediate store is operated on read-in of the echo information at a frequency which is different from the read-out frequency. As a result, it is possible to adjust the read-out speed independently of the read-in speed. In this way, either the whole of the echo information can be read-out slower or quicker than the speed of read-in or, alternatively, a portion of the echo information can be read-out slower or quicker than the remaining part of the echo information.

3,790,926
METHOD FOR DETERMINING THE SPEED OF A VEHICLE

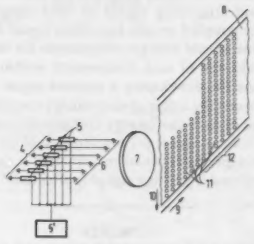
Dietlind Pekau, Krailling, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 13, 1972, Ser. No. 262,341

Claims priority, application Germany, July 6, 1971, P 21 33 524.0

Int. Cl. G01s *9/66*

U.S. Cl. 340—3 R **17 Claims**



A method of determining the speed of vehicle, particularly a ship by the transmission of coherent waves, with echo signals being received at a plurality of points along a receiving line extending parallel to the azimuth direction, with both phase and amplitude information of the received echo signals being recorded as a function of the receiving time, while applying a reference signal, thereby forming one-dimensional holograms, employing an impulse repetition having a time interval T between successive impulses such that the distance *d*, traveled by the vehicle within the time interval T is less than one-half of the overall distance between the first and last of said receiving points, (defining the length *L* of the receiving line), i.e. $d<L/2$ in which a cross correlation function of the one-dimensional holograms of an impulse and the following impulse is formed, whereby the vehicle speed may be calculated from the positions of the correlation maximums.

3,790,927
UNDERWATER SOUND SIGNAL DISCRIMINATING SYSTEM

Adolph M. Chwastyk, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

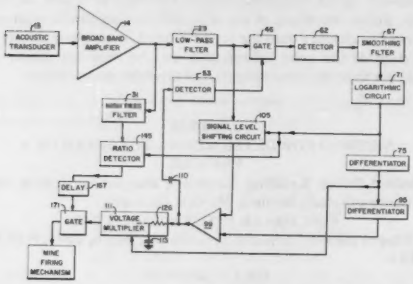
Filed Oct. 15, 1958, Ser. No. 767,489

Int. Cl. H04b *11/00*

U.S. Cl. 340—5 R **16 Claims**

1. An underwater actuation system comprising means for detecting an underwater sound pressure wave and for

developing an electrical signature signal correlative thereto, means for separating said signature signal into a plurality of different energy components, means for detecting the envelope of one of said energy components, means for deriving a signal corresponding to the logarithm of said detected envelope, means for deriving a signal representative of the first derivative of said logarithm signal, means for deriving a signal representative of the second derivative of said logarithm signal, means for developing a triggering signal corresponding to the product of said first and second derivative signals, means coupled to said triggering signal for developing an output, circuit means normally effective for preventing the application of said triggering signal to said output developing means, means coupled to said logarithm signal deriving means and to said one of said energy components for interrupting the passage of said one of said components within the actuation system, means for developing a control signal correlative to the ratio between the other of said energy components and the average value of said one energy component, and means coupled to said control signal for rendering said circuit means effective when a predetermined relationship between said control signal and said triggering signal is effected.

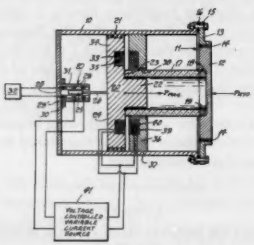


3,790,928

TRANSDUCER PRESSURE RELEASE SYSTEM

Oscar W. Schoen, Jr., Ontario, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1969, Ser. No. 872,433
Int. Cl. H04r 1/44
U.S. Cl. 340—8 R **6 Claims**



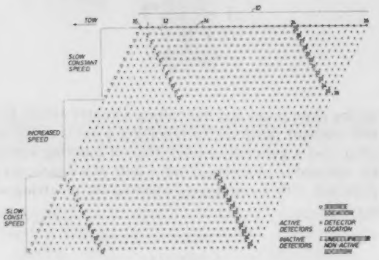
A transducer pressure release system wherein the transducer element is supported between a radiating and a load mass, both of which are resiliently supported in a watertight housing. A pair of magnetic coacting coils, one of which is affixed to said housing and the other to one of the masses, are supplied current through a control means from a constant voltage source. The control means receives an input signal from a displacement sensor which detects the movement of one of the masses and fixes a current through the coils to restore the masses to a constant separation therebetween, thus providing isolation and proper pressure release.

3,790,929

SKIP-SPREAD METHOD FOR SEISMIC SURVEYING

William Harry Mayne, and Thomas R. Crump, both of San Antonio, Tex., assignors to Petty Geophysical Engineering Company, San Antonio, Tex.

Filed Oct. 19, 1971, Ser. No. 190,478
Int. Cl. G01v 1/24
U.S. Cl. 340—15.5 MC **18 Claims**



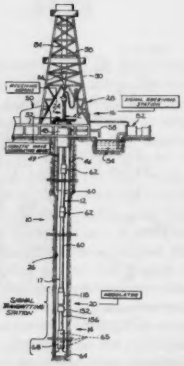
A method of seismic data acquisition wherein the average speed of data acquisition is rapid and the time and total cost necessary for data acquisition are maintained at relatively low levels. A seismic cable may be towed during an activated portion of its travel at a speed sufficiently slow to achieve optimum results of data acquisition and may be towed at a much greater speed during a deactivated portion of its travel thereby causing its average towing speed to be faster than is ordinarily practicable thereby reducing costs of data acquisition without adversely affecting the quality of the seismic data acquired.

3,790,930

TELEMETERING SYSTEM FOR OIL WELLS

Arthur E. Lamel, Arcadia; William D. Squire, and Harper J. Whitehouse, both of San Diego, all of Calif., assignors to American Petroscience Corporation, Bakersfield, Calif.

Filed Feb. 8, 1971, Ser. No. 113,147
Int. Cl. G01v 1/14
U.S. Cl. 340—18 NC **23 Claims**



An acoustic communication method and system for transmitting information through a well bore drill string or other

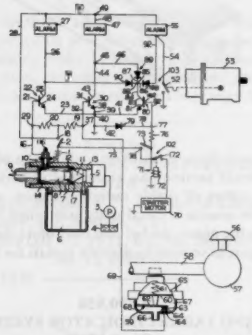
pipe by establishing in the pipe modulated torsional acoustic waves, preferably of zero order, which contain the information to be transmitted and travel from a signal transmitting station to a signal receiving station spaced along the pipe, for demodulating the modulated waves arriving at the receiving station to recover the transmitted information. The modulated waves may be established in the pipe either by driving the pipe in torsional oscillation and modulating the resulting torsional waves in the pipe at the transmitting station or by launching modulated torsional waves through the pipe at the transmitting station. In its principal application, the invention is utilized to monitor selected well drilling parameters, such as temperature, formation pressure, formation porosity, drill string orientation, and/or to operate devices within the well bore. Primary advantages of the invention are reduced acoustic transmission losses from acoustic coupling to the drilling fluid and well bore wall and the ability to transmit information while drilling is in progress. According to the preferred practice of the invention, when monitoring drilling parameters, the torsional acoustic waves are launched downwardly through the drill string from the surface by exciting the upper end of the string in a zero order torsional acoustic oscillation at frequencies within the base band of the drill string acoustic transmission characteristics so as to minimize attenuation of the acoustic waves by the couplings between the drill string pipe sections. These torsional acoustic waves are modulated at a subsurface signal-transmitting station along the drill string and returned back through the string to a surface signal-receiving station where the modulated waves are demodulated to recover the transmitted information.

3,790,931

FILTER BYPASS WARNING CIRCUIT ON A MOTOR VEHICLE

James E. Leveraus, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 30, 1972, Ser. No. 268,061
Int. Cl. G08b *21/00*
U.S. Cl. 340—60 **10 Claims**



An electric warning circuit operated by a filter bypass valve operating as a switch.

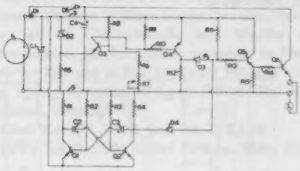
3,790,932

VISUAL BRAKING WARNING DEVICE FOR LAND VEHICLES

Jeffrey David Ridpath, Severn Bridge, Ontario, Canada, assignor to Shakespeare Company, Columbia, S.C.

Filed June 30, 1972, Ser. No. 268,084
Claims priority, application Canada, Jan. 14, 1972, 132,438
Int. Cl. B60q *1/54*
U.S. Cl. 340—62 **10 Claims**

A visual braking warning system for land vehicles, particularly snowmobiles and the like, includes an electrical signal generating means which produces a signal that varies in accordance with the speed of an engine driving the vehicle, measuring means arranged to measure and control the signal from



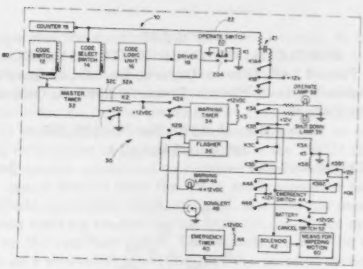
the signal generating means, and means arranged to provide a visual warning to following vehicles when the engine speed is shown by the measuring means to have fallen below a predetermined speed.

3,790,933

VEHICLE SECURITY SYSTEM

Arthur H. Cort, 23 Bittersweet Ln., Weston, Mass.

Filed June 9, 1972, Ser. No. 261,265
Int. Cl. B60r *25/10*
U.S. Cl. 340—63 **8 Claims**



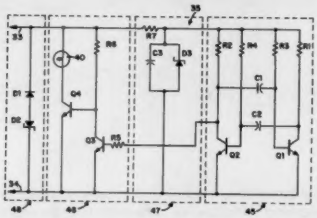
A security system for use in a motor vehicle and particularly one carrying valuable cargo operates to permit normal operation of the vehicle over a predetermined time interval when a proper code has been entered into a code logic means of the system, and subsequently inhibits normal operation of the vehicle such as by locking the brakes of the vehicle after the termination of the predetermined time interval unless a second proper code, preferably different from the previously entered code, has been entered into the code logic means of the system. In a preferred embodiment of the invention the system includes a master timer defining a first time interval the length of which may be dependent upon a portion of the entered code, a warning timer responsive to the termination of the first time interval and defining a second time interval, preferably shorter than the first time interval, and an emergency timer responsive to the termination of the second time interval and operation of an emergency switch for enabling continued operation of the vehicle for a third time interval comparable to the second time interval. The system may also include an electromechanical lock located inside the cargo compartment and second code logic means responsive to entry of a second proper code for opening the lock.

3,790,934

BATTERY OPERATED MOTOR VEHICLE LAMP WARNING FLASHING CIRCUIT

John I. Koeper, New Bremen, Ohio, assignor to Crown Controls Corporation, New Bremen, Conn.

Filed Sept. 5, 1972, Ser. No. 286,030
Int. Cl. B60q *1/46*
U.S. Cl. 340—81 R **2 Claims**



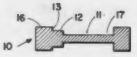
In a battery operated motor vehicle, a warning lamp flasher circuit is provided which includes a free running multivibrator for determining the lamp flashing rate, switch means for controlling current through the warning lamp, a regulated power supply for establishing a regulated voltage for the multivibrator and to suppress any positive transients which may be generated by the vehicle motor control system, and a circuit for suppressing negative voltage transients exceeding a predetermined value.

3,790,935

BUBBLE IN LOW COERCIVITY CHANNEL

Peter Purnell Luff, Ottawa, Ontario, Canada, assignor to Bell Canada-Northern Electric Research Limited, Ottawa, Ontario, Canada

Filed Mar. 26, 1971, Ser. No. 128,285
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF **3 Claims**



The surface of a magnetic oxide layer, or platelet, has one or more cavities formed therein. The cavities extend in a predetermined pattern and the bottom of each cavity has a coercivity lower than the coercivity at the surface of the layer. Thus magnetic domains follow the pattern of a cavity. A cavity may be formed with a base surface and at least one intermediate surface which has a coercivity intermediate the bottom or base surface, and the outer surface. The bottom of a cavity can be given a stepped formation to provide positive domain locations along a cavity.

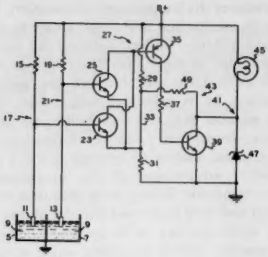
3,790,936

FLUID LEVEL DETECTOR

William C. Knoll, Turbotville, Pa., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Apr. 27, 1972, Ser. No. 247,971
Int. Cl. B60g *1/00;* **G08b** *21/00*
U.S. Cl. 340—244 E **10 Claims**

A shift in liquid level of apparatus having dual containers each including an electrically conductive liquid is indicated by activation of a voltage divider circuit coupled to each container and to a switching means which activates a first electron device and, in turn, activates a second electron device having a load circuit with an indicator device and a feedback circuit for effecting saturated conduction of the electron devices.

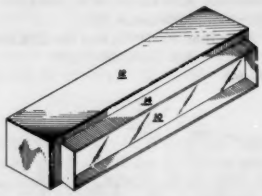


3,790,937

SIGNAL LIGHT

Donald M. Munroe, Ithaca, N.Y., assignor to Charles C. Krawczyk, Brighton, N.Y.

Filed June 29, 1971, Ser. No. 157,843
Int. Cl. G08g *1/95;* **G08b** *5/00*
U.S. Cl. 340—378 R **14 Claims**



An enclosure for a signal light includes an elongated radiation transparent section. An elongated radiation source provides three colors of visible radiation, green, amber and red. The radiation source is electrically controlled for sequentially transmitting the green, amber and red colors through the elongated transparent section to provide signals for traffic control.

3,790,938

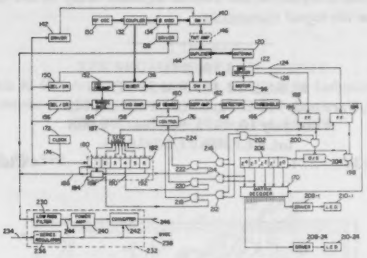
MOVING TARGET INDICATOR SYSTEM AND APPARATUS

Richard W. Anderson, Reading, Mass.; Bernard J. Weiss, Deerfield, N.H., and Hubert E. Holley, Melrose, Mass., assignors to Cygned, Inc., Salem, N.H.

Filed May 25, 1972, Ser. No. 256,792
Int. Cl. G01s *9/42*
U.S. Cl. 343—7.7 **25 Claims**

A moving target indicator system includes a signal source for generating an RF output signal, a code generator for generating a primary code train and a plurality of secondary code trains delayed relative to the primary code train, and modulator means responsive to the primary code train to modulate the RF output signal to produce a coded RF output signal. The coded RF output signal is transmitted and coded echo signals reflected by targets are compared with a selected secondary code train to produce a unipolar signal train with

doppler modulation information if a matching relation exists between the coded echo signals and the secondary code train.



The doppler modulation of the unipolar signal train is detected and a corresponding indicator is actuated.

3,790,939

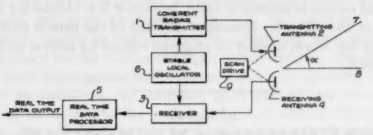
REAL TIME SYNTHETIC RADAR

James Nickolas Constant, 1603 Danbury Dr., Claremont, Calif.

Continuation-in-part of Ser. No. 46,409, June 15, 1970, abandoned. This application May 12, 1972, Ser. No. 252,711

Int. Cl. G01s *9/233*

U.S. Cl. 343—10 **14 Claims**



A coherent synthetic aperture radar with a scanning transmitter beam and a data processor, preferably operating in real time and preferably with CW transmitter operation, providing target coordinates, including range, without requiring comparison of echo and transmitted pulses for range data.

3,790,940

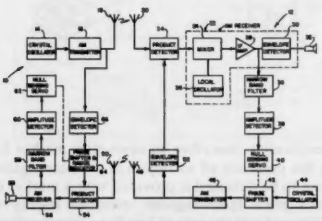
COMMUNICATION APPARATUS HAVING A RANGING CAPABILITY

Harold D. Becker, Buffalo, N.Y., assignor to Cornell Aeronautical Laboratory, Inc., Buffalo, N.Y.

Filed Oct. 12, 1971, Ser. No. 188,046

Int. Cl. G01s *9/38*

U.S. Cl. 343—12 R **13 Claims**



A communication apparatus having a ranging capability wherein the phase of a ranging tone is locked to the phase of the modulation on a transmitted radio frequency signal by a null sensing servo which shifts the phase of the ranging tone until the energy at the carrier frequency of the output of a product detector is brought to zero, the inputs to which comprise the radio frequency signal and the ranging tone.

3,790,941

ANTENNA TRACKING SYSTEMS

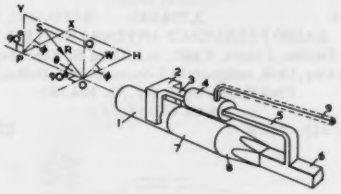
Malcolm Chivers; Thomas William Grant Dawson; Paul Henry Masterman, all of Christchurch, and Martin Andrew Weston, New Milton, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 27, 1972, Ser. No. 238,626

Claims priority, application Great Britain, Mar. 31, 1971, 8,304/71

Int. Cl. H01q *21/24*

U.S. Cl. 343—100 PE **8 Claims**



Apparatus for controlling a steerable antenna to track a distant radio source, according to the relative phase and amplitude of TMO1 mode signals and TE11 mode signals developed in a circular waveguide which receives the radio signals collected by the antenna. The apparatus comprises a TMO1 mode coupler and a modulator arranged to apply a cyclic modulation to signals derived from the TMO1 mode, a second coupler connected to combine the modulated signals with signals derived from the TE11 mode signals to form an amplitude-modulated resultant signal, and detector means for deriving tracking control signals from the amplitude modulation on the resultant signal. The modulation may be a sawtooth or a sinusoidal waveform and the detector means may comprise a phase sensitive detector for comparing the amplitude modulation with the modulation control waveform. Alternatively the modulation may be a four-step staircase or a staircase with the steps transposed; then the detector means may comprise four detectors arranged to operate in synchronism with the steps of the staircase and two differential amplifiers. The second coupler may be connected to the circular waveguide by a polarizer. The modulator may be a ferrite phase shifter but a diode balanced modulator may be used if the modulation is sinusoidal.

3,790,942

RADIO BEACON WITH A ROTATING CARDIOID RADIATION PATTERN IN PARTICULAR FOR USE IN LANDING GROUNDS OF SECONDARY IMPORTANCE

Henri Becavin, and Michel Ronsin, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 25, 1972, Ser. No. 256,966

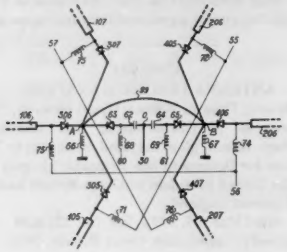
Claims priority, application France, June 1, 1971, 7119689

Int. Cl. G01s *1/40*

U.S. Cl. 343—106 R **4 Claims**

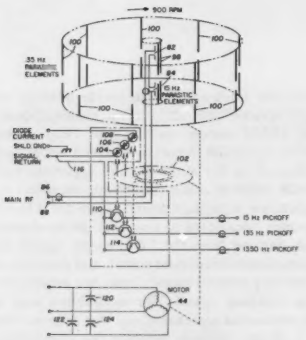
A radio beacon which requires only a low power for its operation and in which maintenance is reduced to a minimum. The rotating lobe is produced by means of an antenna with

three dipoles which, by switching, are successively fed in phase with the omnidirectional antenna and then successively,



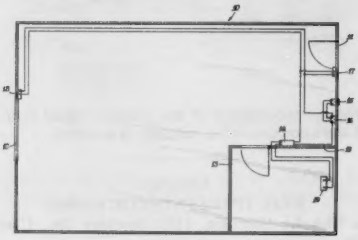
in phase opposition therewith, this giving six positions of the rotating cardioid diagram.

3,790,943
RADIO FREQUENCY ANTENNA SYSTEM
Sidney Pickles, Colusa, Calif., and Dean S. Thornberg, Salt Lake City, Utah, assignors to E-Systems, Inc., Dallas, Tex.
Filed Feb. 9, 1972, Ser. No. 224,783
Int. Cl. G01s *1/44*
U.S. Cl. 343—106 R **22 Claims**



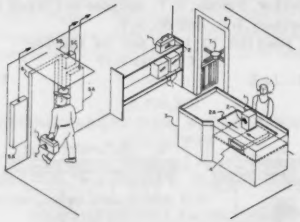
Tactical radio navigation systems provide distance measuring information to an interrogating aircraft in response to pairs of interrogation pulses received at a beacon transponder, the system also provides bearing and identification information. The transponder receives pairs of interrogation pulses which are decoded into a single pulse for operation of a reply transmitter. Bearing, distance and identification determining signals are generated by the reply transmitter and its antennas. A single antenna functions to both receive the interrogation pulses and radiate the position determining signals. To provide the required bearing information, the antenna radiates pulses from a central antenna array that is stationary with respect to a support housing. These pulses are modulated at a 15 Hz frequency by parasitic elements rotating around the stationary central array. Further modulation of the transmitted pulses at a 135 Hz frequency, superimposed on the 15 Hz frequency, is provided by additional parasitic elements also rotating about the central antenna array. Both the low band frequency parasitic elements and the high band frequency parasitic elements have a configuration to provide improved radiation from the antenna above the horizontal. Also to improve the antenna radiation pattern, the 135 Hz parasitic elements are positioned on a rotating drum of a dielectric material, such as fiberglass. To still further improve the amount of radiation energy above the horizontal reference, radio frequency chokes are coupled to the central antenna array in the feed line from the signal transmitter.

3,790,944
BURGLAR ALARM SYSTEM
Peter H. Yarwood, 910 E. Sayles Dr., Palatine, Ill.
Filed July 10, 1972, Ser. No. 270,088
Int. Cl. G08b *21/00, 19/00*
U.S. Cl. 340—274 **4 Claims**



A single battery powered burglar alarm system for building having an alarm and the battery positioned within a locked box and a plurality of sensor switch elements located externally of the box at strategic locations around the building. The electrical circuit is normally open, but once it is closed for actuation of the alarm by closing of any one of the sensor switch elements the alarm cannot be stopped except by access to the locked box.

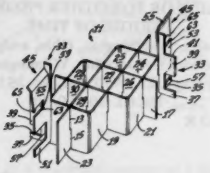
3,790,945
OPEN-STRIP FERROMAGNETIC MARKER AND METHOD AND SYSTEM FOR USING SAME
Edward R. Fearon, Tulsa, Okla., assignor to Stoplifter International, Inc.
Division of Ser. No. 747,050, March 22, 1968, Pat. No. 3,631,442, and a continuation-in-part of Ser. No. 680,666, Nov. 6, 1967, abandoned. This application Nov. 24, 1971, Ser. No. 201,686
Int. Cl. G08b *13/24*
U.S. Cl. 340—280 **18 Claims**



The specification describes an open-strip marker for use in detecting the presence of an object in an interrogation zone. Each object to be detected is provided with a marker comprising an elongated ferromagnetic element having a high permeability and a high ratio of length to cross-sectional area. A periodically varying magnetic field is provided in an area through which the object is to pass. Upon passage of the object through the area, reversal of the magnetization of the

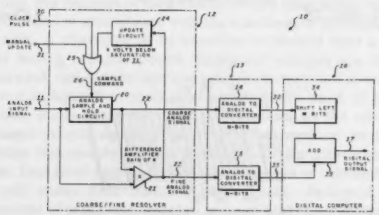
marker results in a uniquely characteristic signal for each alternation of the electromagnetic field. This characteristic signal is sensed to distinguish the presence of the object.

3,790,946
BAR SEGMENT READOUT UNIT
John E. Hendricks, Encino, Calif., assignor to Industrial Electronics Engineers, Inc., Van Nuys, Calif.
Filed Aug. 24, 1970, Ser. No. 66,475
Int. Cl. G09f *9/34*
U.S. Cl. 340—336 **6 Claims**



A bar segment readout unit having a face plate against which a viewing screen is positioned by shoulder-forming strips attached to the plate. Lugs formed integral with the strips extend perpendicular from the plate toward the rear of the readout and have locking tabs thereon for holding the ends of an eggcrate light shield in position. A seven segment bar readout mask is positioned between the light shield and the viewing screen such that the lamp receiving cells of the light shield are each positioned over one bar segment. A lamp holder having spring-like fingers extending into each cell is mounted on the end of the light shield opposite the mask and is held thereagainst by a terminal plate. A plurality of lamps are mounted on the terminal plate and extend through the lamp holders into the cells of the light shield. The terminal plate is held in position by means of prongs formed on the ends of the light shield.

3,790,947
METHOD AND MEANS FOR INCREASING THE RESOLTUION OF ANALOG-TO-DIGITAL CONVERTER SYSTEMS
Curtis M. Campbell; Walter J. McConnell, and Edmund R. Skutecki, all of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Nov. 17, 1971, Ser. No. 199,698
Int. Cl. H03k *13/02, 13/22*
U.S. Cl. 340—347 AD **9 Claims**



An increased resolution analog-to-digital converter system comprises a sample and hold circuit for storing an instantaneous value of the analog input signal to be converted. A difference amplifier coupled to receive the output of the sample and hold circuit and the analog input signal provides the difference therebetween with a gain of K. The outputs from the sample and hold circuit and the difference amplifier are transformed to digital format by analog-to-digital converter means. The digitally converted signal from the sample and hold circuit is shifted in the direction of increasing bit significance a number of places equal to $\log_2 K$. The digitally converted signal from the difference amplifier is added to the shifted signal to provide the increased resolution digital output signal.

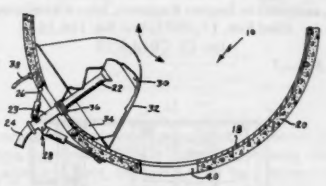
ERRATA

For Classes 340—146.10 F thru 340—173 DR see:
Patents Nos. 3,790,954 thru 3,790,961

3,790,948
RADIO TRANSMITTING HUNTING ARROW WITH FINDING MEANS
John M. Ratkovich, 1460 Asbury St., Evanston, Ill.
Filed June 12, 1972, Ser. No. 261,705
Int. Cl. G01s *3/14*
U.S. Cl. 343—113 R **8 Claims**

A battery-powered radio transmitter is carried in the tip of a hunting arrow to aid in locating wounded game. The antenna for the transmitter is carried in the hollow shank of the arrow so that breakage of the shaft will not be detrimental to transmission of radio signals from the transmitter.

3,790,949
SURVIVABLE GROUND ANTENNA SYSTEM
Thomas F. McGraw, 7538 Axton St., Springfield, Va.
Filed Dec. 13, 1972, Ser. No. 314,624
Int. Cl. H01q *1/04*
U.S. Cl. 343—719 **10 Claims**



A survivable ground antenna system which relies upon its location within the earth for protection from natural or man-made forces. The antenna system utilizes a "point source" feed located within a main reflector in conjunction with a subreflector for communicating with a target. The feed is adjustably mounted therein and capable of operation even though located beneath the surface of the ground.

3,790,950

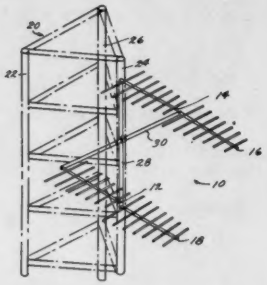
ANTENNA ARRAY FOR MINIMIZING CO-CHANNEL INTERFERENCE

Thomas D. Smith, Doraville, and Jasper B. Weston, Jr., Tucker, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Continuation of Ser. No. 18,365, March 12, 1970, abandoned, which is a continuation of Ser. No. 570,570, Aug. 5, 1966, abandoned. This application Sept. 13, 1971, Ser. No. 180,147

Int. Cl. H01q *11/10*

U.S. Cl. 343—792.5 **3 Claims**



An antenna system for reducing co-channel interference in a signal receiving network, said system comprising; at least four logarithmically periodic antenna elements having corresponding points disposed in a common plane, a first two of said antenna elements also disposed within a horizontal plane, the remaining two of said antenna elements also disposed within a vertical plane, said first two elements being substantially equal first distances from the line of intersection of said horizontal and vertical planes and said remaining two elements being substantially equal second distances from the said line of intersection; a support structure; and means for cantilever mounting said antenna elements on said structure with the maximum sensitivities of said antenna elements directed outwardly from said support structure.

ERRATA

For Classes 343—7.7 thru 343—106 R see:
Patents Nos. 3,790,938 thru 3,790,943

3,790,951

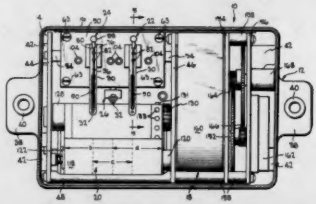
APPARATUS FOR MEASURING AND RECORDING ACCELERATION FORCES

Richard J. O'Neill; Gene M. Blaker, both of Champaign; Edward C. Manthei, and Elmer L. Ronk, both of Mahomet, all of Ill., assignors to Impact Registers, Inc., Champaign, Ill.

Filed Feb. 17, 1971, Ser. No. 116,151

Int. Cl. G01d *9/10*

U.S. Cl. 346—7 **9 Claims**



A compact apparatus for measuring and recording acceleration forces by measuring three mutually perpendicular components and recording the components on a recording chart by means of three independent stylii. The stylii are mounted so that one stylus is displaced longitudinally on the chart with respect to the other stylii to permit lateral overlapping of the tracks of the three stylii resulting in a narrower recording chart and a more compact instrument. The mass affiliated with each stylus is rotatably mounted at its center of mass for increased accuracy and a novel spring mounting on the stylus arms results in an improved accuracy and frequency response.

3,790,952

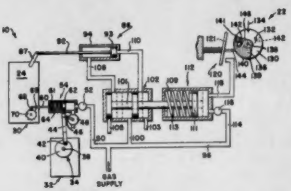
SYSTEM FOR PRINTING OUT THE METERED FLOW OF A FLUID DAILY OR FOR OTHER PREDETERMINED PERIODS OF TIME

Michael P. Debaets, Worthington, Ohio, assignor to Columbia Gas System Service Corporation, Wilmington, Del.

Filed Apr. 23, 1973, Ser. No. 353,700

Int. Cl. G01d *9/00*

U.S. Cl. 346—33 R **17 Claims**



A system for recording the amount of gas which is metered each day by reading-out the unit measurements of a meter which reads a continuing total. The continuing total of the meter is read monthly, and a printer record shows the amount which is consumed each day of the month. The read-out mechanism and an automatic printer are operated by gas flow once every 24 hours under the control of a battery-operated clock. Other selected print out cycles, such as hourly read out, can be selected by utilizing a battery-operated clock of the proper rotation cycle.

3,790,953

DEFLECTION ELECTRODE ASSEMBLY FOR AN INK JET TYPE PRINTING DEVICE AND A METHOD FOR MANUFACTURING THE SAME

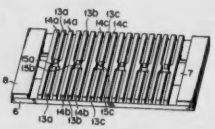
Yuji Sugiya, Tokorozawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,924

Claims priority, application Japan, Feb. 28, 1972, 47/20391

Int. Cl. G01d *15/16*

U.S. Cl. 346—75 **3 Claims**

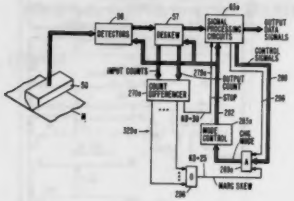


A deflection electrode assembly for an ink jet type printing device has such a construction that plural X- and Y-axis deflection electrodes etch-formed from an electroconductive plate overlie an opening of an insulating substrate through which ink droplets jetted from plural juxtaposed nozzles can be passed all at a time.

3,790,954
SKEW CONTROLLED READBACK SYSTEMS

Ernest W. Devore, Boulder, and John W. Irwin, Loveland, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1972, Ser. No. 317,985
Int. Cl. G06k 5/04; G11b 27/36
U.S. Cl. 340—146.1 F 15 Claims

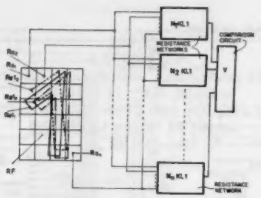


Marginal skew in a readback system of a digital multitrack magnetic signal recorder selectively actuates a gating system for selectively passing control signals for effecting control functions in signal processing circuits. The control function may include a mode change of handling readback signals, for example, initiating deadtracking operations even though apparent successful readback is occurring.

3,790,955
RASTER PROCESS FOR CLASSIFYING CHARACTERS

Arthur Klemt, Schwalbeneck, Germany, assignor to Arthur Klemt Kommanditgesellschaft, Schwalbeneck, Germany

Filed May 25, 1971, Ser. No. 146,677
Claims priority, application Germany, May 27, 1970, P 20 26 033.7
Int. Cl. G06k 9/06, 9/10
U.S. Cl. 340—146.3 MA 4 Claims

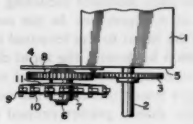


A raster process for classifying presented characters into m classes, the features of each character in a class being variable, is disclosed in accordance with the teachings of the present invention. A character to be classified is imaged onto a raster field having n raster points. Electrical voltages are derived from each raster point and are selectively supplied to no more than n independent resistance networks for each of said m classes. Each resistance network responds to the electrical voltages selectively supplied thereto to produce an output voltage representative of a form part of the character of a class. Said form part is selectively comprised of selected areas of said raster field which should remain darkened for a character of said class, selected areas of said raster field which should remain light for a character of said class, or two selected raster field areas which should exhibit approximately equal degree of darkened areas or lightened areas for a character of said class. The output voltage produced by each resistance network is compared to a threshold level associated with said class. If the output voltage produced by each resistance network in a class is below said threshold level, the presented character is classified as belonging to said class.

3,790,956
ARRANGEMENT FOR PRESETTING A TELEVISION TUNER

Katsumi Ichikawa, and Shin Fujie, both of Aichi-ken, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 30, 1972, Ser. No. 301,806
Claims priority, application Japan, Nov. 5, 1971, 46/103697; Nov. 30, 1971, 46/113147; Nov. 30, 1971, 46/113148
Int. Cl. H04q 1/00; H04b 1/06
U.S. Cl. 340—148 4 Claims

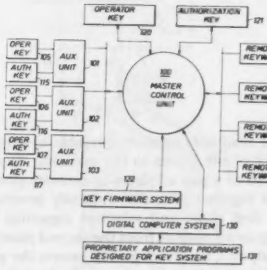


A compact arrangement for presetting a television tuner, so designed that a motor is driven in response to a signal, such as an ultrasonic wave, given thereto externally and a tuner shaft is rotated by the drive of said motor, whereby channel selection is controlled from a remote point, in which a program switch for stopping the motor at a desired channel but not stopping it at the other channels is arranged on the front side of the tuner, whereby the tuner presetting operation is facilitated.

3,790,957
KEY AUTOMATED DATA COLLECTION, CONTROL AND SOURCE INFORMATION SYSTEM

Lee R. Dukes, 2828 Bammel Ln., Houston, and William W. Witt, Richmond, both of Tex.

Continuation-in-part of Ser. No. 167,112, July 29, 1971, abandoned. This application Nov. 24, 1972, Ser. No. 309,469
Int. Cl. G06k 7/06; H04q 3/02
U.S. Cl. 340—149 R 10 Claims

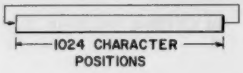


Key automated data collection, control and source information system comprising a key operated locking device, a message encoding unit, and connected to a master control. The key operated device includes a conventional lock type receptacle for receiving a key, having a unique digital code associated therewith. A secondary security locking device may be engageable with the key to prevent removal from the lock's key receptacle. The message encoding unit senses the unique digital code and provides electrical signals representative thereof to a master control system. The master control system may be made responsive to the digital key code for recording and verification of the code, selective activation of the key operated device, and release of the key.

3,790,958
DATA COMMUNICATION TERMINAL

Joseph P. Hruschak, and George R. Ellis, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 74,095, Sept. 21, 1970, abandoned. This application Sept. 9, 1971, Ser. No. 179,136
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 **12 Claims**

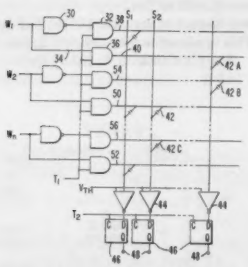


A data communication terminal including a storage device having a capacity of n characters. In the compose mode of operation wherein the input to the terminal is a random data source, such as from a keyboard, the input data stored in the storage device is automatically monitored to determine the number of characters stored therein. If the number of characters stored is greater than a predetermined maximum block size of yn characters, a data block comprising kn characters is prepared for transmission to an output device when $k \leq y < 1$. If the block of kn characters is received without error by the output device, the block of kn characters is cleared from the storage device, or, alternatively, the block of kn characters is retransmitted to the output device.

3,790,959
CAPACITIVE READ ONLY MEMORY

Cornelius Eldert, Ypsilanti, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 26, 1972, Ser. No. 265,963
Int. Cl. G11c *17/00*
U.S. Cl. 340—172.5 **7 Claims**



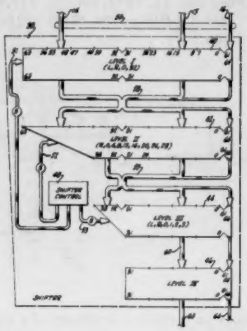
A capacitive read only memory operable to respond to the logical product of the inputs to the memory. The read only memory consists of a pair of plates or memory planes capacitively coupled together. Circuitry logically inverts the input pulses to the first plane and selective capacitor placement creates pulsing on all outputs from the second plane except on the desired output. Circuitry logically inverts the pulses from the second plane resulting in an output which is the logical product of the input signals.

3,790,960
RIGHT AND LEFT SHIFTER AND METHOD IN A DATA PROCESSING SYSTEM

Gene M. Amdahl, Saratoga; Michael R. Clements, and Lyle C. Topham, both of Santa Clara, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Oct. 30, 1972, Ser. No. 302,227
Int. Cl. G11c *19/00, 13/00*
U.S. Cl. 340—172.5 **13 Claims**

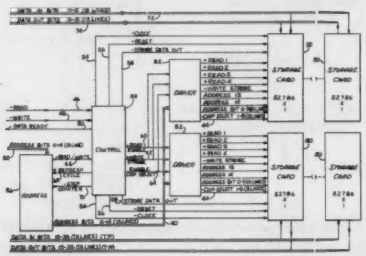
Disclosed is a bidirectional shifter and method for use in a data processing system for right and left shifting of data. A right shifter performs a right shift by translating the data to the right and performs a left shift by rotating the data, translating the data to the right and thereafter rerotating the data. Rotation and translation occur in one logic level. The number of bits translated is decreased in successive logic levels.



3,790,961
RANDOM ACCESS DYNAMIC SEMICONDUCTOR MEMORY SYSTEM

Thomas L. Palfi, Cupertino; Charles Brooks, Sunnyvale, and George J. Miller, San Jose, all of Calif., assignors to Advanced Memory Systems, Inc., Sunnyvale, Calif.

Filed June 9, 1972, Ser. No. 261,427
Int. Cl. G11c *11/24, 13/00*
U.S. Cl. 340—173 DR **7 Claims**



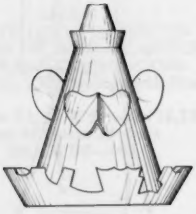
A timing and priority assigning system for the automatic operation and refresh of a dynamic semiconductor memory operative with input-output signals characteristic of a magnetic core memory. A timing means is provided for the automatic execution of a read or write command for the semiconductor memory. A second timing system is provided which is initiated by a refresh oscillator so as to periodically and sequentially refresh a portion of the semiconductor memory. A counter is provided to retain the refresh address and to be advanced by a signal from the refresh oscillator. A means is also provided for automatically assigning priority to an externally received read or write command so as to reset a refresh cycle then in operation, or to prevent the initiation of a refresh cycle, until the execution of the command, whereby the refresh cycle is again automatically reinitiated upon the completion of the command.

DESIGNS

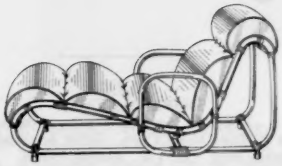
FEBRUARY 5, 1974

230,224
ONE-PIECE GARMENT
Mary I. Ealy, Monee, Ill., assignor to Merry Jumpsuits
Filed Feb. 4, 1972, Ser. No. 223,815
Term of patent 3½ years
Int. Cl. D2—*02*
U.S. Cl. D2—30

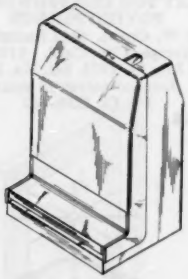
230,225
CONE CAP
Alberto Birlain Schafler, Amsterdam 218–201, Mexico 11, D.F. Mexico
Filed Apr. 20, 1972, Ser. No. 246,119
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—250



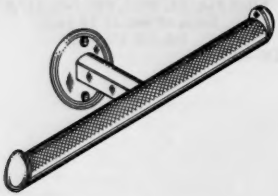
230,226
LOUNGE
Henry Olko, Applegreen Drive, Old Westbury, N.Y. 15568
Filed Jan. 11, 1972, Ser. No. 217,076
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38



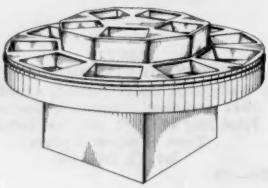
230,227
STORAGE BIN FOR BATHROOM IMPLEMENTS
Georg Weihrauch, Burgermeister, Arnold-Strasse, 6949 Aschbach, Odenwald, Germany
Filed July 19, 1971, Ser. No. 164,212
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—86



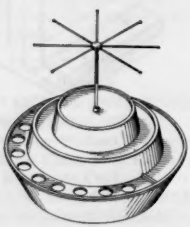
230,228
TOILET PAPER HOLDER
Herman K. Dupre, Seven Springs, Champion, Pa. 15622
Filed Apr. 27, 1973, Ser. No. 355,090
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—97



230,229
DISPLAY STAND
Welden L. Dolgoff, Seattle, Wash., assignor to ABC Record & Tape Sales Corp., doing business as Display Equipment Mfg. Co., Inc., Seattle, Wash.
Filed July 28, 1972, Ser. No. 276,054
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—146

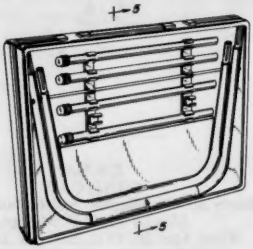


230,230
DISPLAY FOR CUT FLOWERS AND POTTED PLANTS
Robert W. Crowe, 4942 Encinita Ave., Temple City, Calif. 91780
Filed July 19, 1972, Ser. No. 273,336
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—148

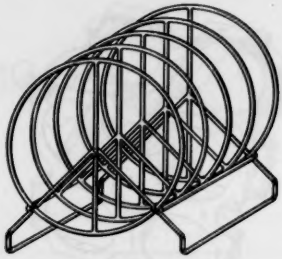


230,231
TABLE
Mackie S. Merritt, 23613 Deanhurst, St. Clair Shores, Mich. 48082
Filed July 19, 1971, Ser. No. 164,174
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

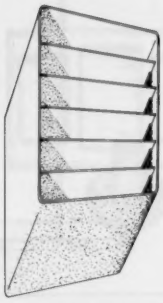
230,232
PORTABLE CARRYING CASE
Fred Howard, New York, and Denis Michetti, Staten Island, N.Y., assignors to Howard Displays, Inc., New York, N.Y.
Filed Nov. 26, 1971, Ser. No. 202,738
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D6—178



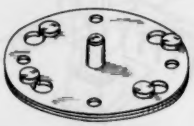
230,233
RECORD RACK
Lawrence P. Gentieu, 2008 Delaware Ave., Wilmington, Del. 19806
Filed Dec. 7, 1970, Ser. No. 26,324
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—185



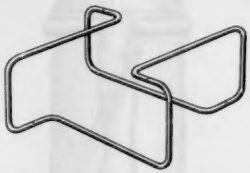
230,234
COMPARTMENT FILE
Sven-Eric Juhlin, Gustavsberg, Sweden, assignor to AB Gustavsbergs Fabriker, Gustavsberg, Sweden
Filed May 10, 1972, Ser. No. 252,149
Claims priority, application Sweden Nov. 12, 1971
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188



230,235
LOCKABLE PLATE UNIT FOR USE ON A FURNITURE LEG OR SIMILAR ARTICLE
Kenneth A. Green, R.R. 2, Cambridge, Ohio 43725, and Lawrence A. Streblow, 2317 Springbrook Road, Kenosha, Wis. 53140
Filed Nov. 23, 1970, Ser. No. 26,134
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

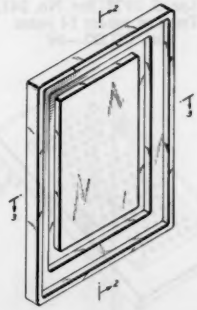


230,236
TABLE BASE
Jeffery R. Fear, 473 Brunswick Ave., and Wolfgang Triebsch, 2 Sultan Court, Apt. 408, both of Toronto 181, Ontario, Canada
Filed Jan. 27, 1972, Ser. No. 221,491
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194

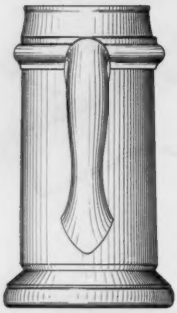


230,237
DENTAL OPERATING CHAIR SEAT
Daryl Raymond Beach and Tetsuo Oshida, Kyoto, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan
Filed June 30, 1972, Ser. No. 267,854
Claims priority, application Japan Dec. 30, 1971
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197

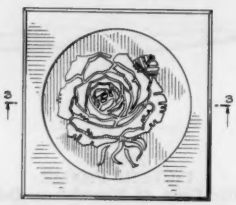
230,238
PICTURE FRAME
Alfred Coda, 48 Wyandemere Drive, Woodcliff Lake, N.J. 07675
Filed May 24, 1971, Ser. No. 143,705
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—241



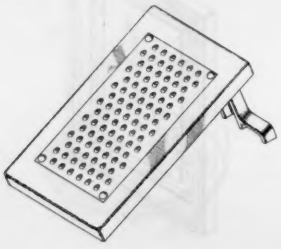
230,239
DRINKING MUG
George Dodge, Westport, N.Y., assignor to Dipak Manufacturing Co. Inc., Westport, N.Y.
Filed Oct. 4, 1972, Ser. No. 298,753
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9



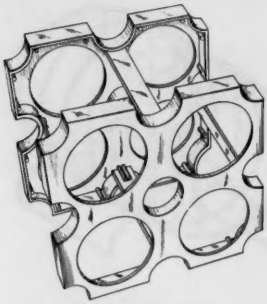
230,240
COASTER
Michael S. Kaffel, 515 E. 89th St., New York, N.Y. 10009
Filed Nov. 10, 1972, Ser. No. 305,562
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—45



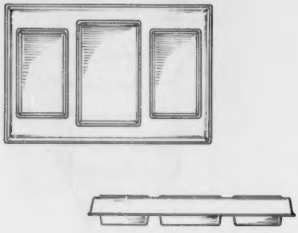
230,241
PRODUCE GRATER
Frederick W. Riddington, Ontario, Calif., assignor to Sunkist Growers, Inc., Sherman Oaks, Calif.
Filed Apr. 5, 1972, Ser. No. 241,487
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47



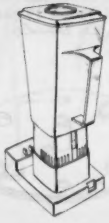
230,242
WINE RACK
Maxwell Bentley, 1331 Newbridge Road, North Bellmore, N.Y. 11710
Filed May 22, 1972, Ser. No. 255,964
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D7—71



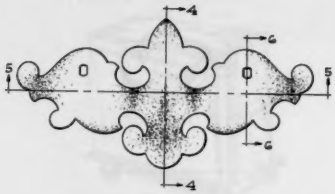
230,243
FOOD WARMER WITH REMOVABLE FOOD COMPARTMENTS
Thomas R. Ottenstein, Bethesda, Md., assignor to Electric Char-B-Que, Inc., Red Bank, N.J.
Filed Feb. 22, 1972, Ser. No. 228,472
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—96



230,244
ELECTRIC BLENDER OR SIMILAR ARTICLE
Jack W. Kalbfeld, Old Bethpage, N.Y., assignor to Van Wyck International Corporation, New York, N.Y.
Filed June 29, 1972, Ser. No. 267,618
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—154



230,245
BACKING PLATE FOR PULLS
Emil J. Bocade, Wyoming, Mich., assignor to Keeler Brass Company, Grand Rapids, Mich.
Filed Sept. 29, 1972, Ser. No. 293,441
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—179



230,246
FRUIT HARVESTING IMPLEMENT
William A. Turner, 205 Sycamore Road, Franklin, Va. 23851
Filed Jan. 10, 1972, Ser. No. 216,917
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—1

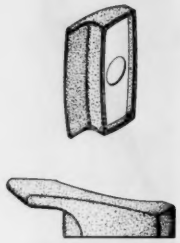
230,247
GARDEN TOOL
Richard K. Parry, St. George, Utah (2855 Canonita Drive, Fallbrook, Calif. 92028)
Filed Feb. 14, 1972, Ser. No. 226,395
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—6

230,248
TUBE BENDER
Laurice D. Ely, 2862 Stromboli Road, Costa Mesa, Calif. 92626
Filed July 6, 1972, Ser. No. 269,470
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—32

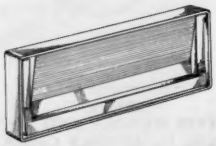
230,249
ELECTRIC SHEARS
John K. Miles, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.
Filed Mar. 7, 1972, Ser. No. 232,656
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—61

230,250
COMBINED DOOR HANDLE AND LOCK HOUSING
William J. Horgan, Jr., Allegheny County, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Continuation-in-part of design applications Ser. No. 13,608, July 18, 1968, Ser. No. 19,456, Oct. 8, 1969, and Ser. No. 21,815, Mar. 9, 1970. This application June 1, 1970, Ser. No. 23,211
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—138

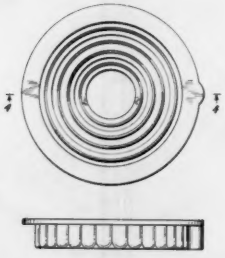
230,251
DOOR HANDLE
Russell W. Waldo, St. Paul, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.
Filed July 24, 1972, Ser. No. 274,413
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—150



230,252
HANDLE FOR AN INSTRUMENT CASE
Lance A. Wilkes and Edward Vescuso, Jr., Canoga Park, Calif., assignors to System Metals, Inc., Canoga Park, Calif.
Filed Sept. 22, 1971, Ser. No. 182,930
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—154



230,253
ESCUTCHEON PLATE
Willard H. Sahloff, Bridgeport, Conn., assignor to Handy-Andy Specialty Co., Inc., New York, N.Y.
Filed Nov. 20, 1972, Ser. No. 308,187
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D8—187



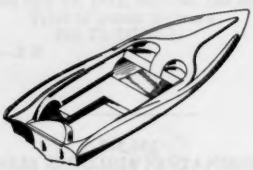
230,254
RETAINER
Robert E. Smith, Kettering, Ohio, assignor to Dayton Progress Corporation, Dayton, Ohio
Filed Feb. 17, 1970, Ser. No. 21,475
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—274

230,255
BOTTLE OR SIMILAR ARTICLE
Livingston C. Douglas, Leonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 25, 1972, Ser. No. 220,725
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—47

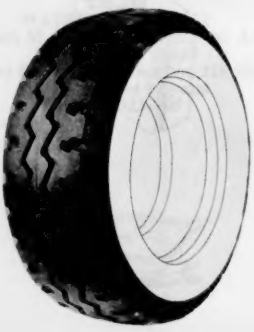
230,256
BEVERAGE BOTTLE
John L. Ckola, 3833 Jewell St., San Diego, Calif. 92109
Filed May 2, 1972, Ser. No. 249,754
Term of patent 3½ years
Int. Cl. D9—*01*
U.S. Cl. D9—102

230,257
MOBILE CART
Louis J. Corini, Philadelphia, Pa., assignor to Melbro Corporation, Philadelphia, Pa.
Filed Mar. 23, 1972, Ser. No. 237,605
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—27

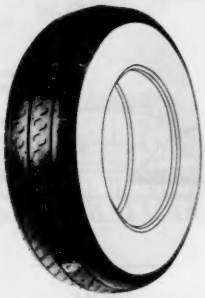
230,258
BOAT
Paul Allison, Old Knoxville Highway, Maryville, Tenn. 37801
Filed July 21, 1972, Ser. No. 273,997
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



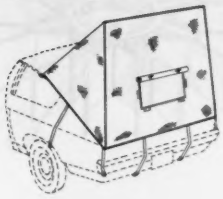
230,259
TIRE
Daniel E. Schuster, North Royalton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 2, 1972, Ser. No. 223,045
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



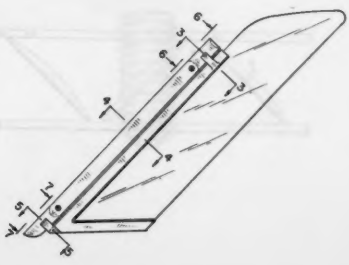
230,260
TIRE
John T. Smith, Norton, and James W. Stiffler, Tallmadge, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sept. 15, 1971, Ser. No. 180,945
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—145



230,261
TENT FOR REAR-DOORED VEHICLE
Frederick W. Woodward, Dearborn Heights, Mich., assignors to Donald Thornber and B. Bernice Thornber
Filed June 12, 1972, Ser. No. 261,841
Term of patent 14 years
Int. Cl. D21—*04;* D12—*08*
U.S. Cl. D12—156

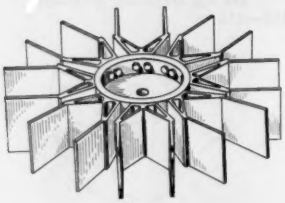


230,262
WINDOW VENT
Raymond A. McCarroll, 1725 Newcastle, Grosse Pointe Woods, Mich. 48236
Filed Mar. 24, 1972, Ser. No. 238,000
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

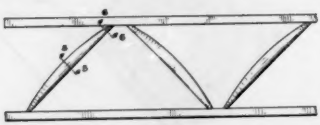


230,263
OUTSIDE REAR VIEW MIRROR FOR VEHICLES
Faustino Trambusti, Corso Orbassano 402/21, Torino, Italy
Filed Aug. 9, 1971, Ser. No. 170,399
Term of patent 7 years
The portion of the term of the patent subsequent to Jan. 23, 1980, has been disclaimed
Int. Cl. D12—*16*
U.S. Cl. D12—187

230,264
HUB STRUCTURE
Thomas C. Howard, Raleigh, N.C., assignor to Charter Industries, Inc., Raleigh, N.C.
Filed Sept. 28, 1971, Ser. No. 184,644
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 H

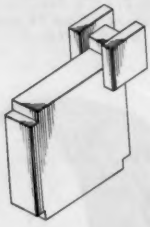


230,265
TRUSS
Melvin L. Ollman, Detroit, Mich., assignor to C-O, Inc., Detroit, Mich.
Filed Aug. 11, 1971, Ser. No. 171,030
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 H

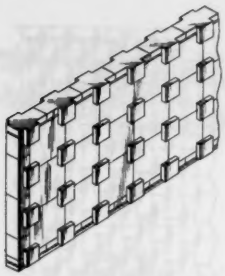


230,266
HOUSE OR SIMILAR ARTICLE
James Reid Thomson, 705 N. 25th St., Philadelphia, Pa. 19130
Division of design application Ser. No. 22,894, May 8, 1970, now Patent No. 222,130, which is a continuation-in-part of abandoned application Ser. No. 19,606, Oct. 17, 1969. Divided and this application July 8, 1971, Ser. No. 160,995
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

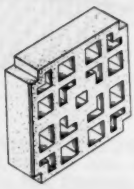
230,267
COMBINATION BUILDING BLOCK
Bernice W. Shuey, 3323 Latham Drive, Dallas, Tex. 75229
Filed July 19, 1971, Ser. No. 164,206
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 R



230,268
BUILDING BLOCK WALL
Bernice W. Shuey, 3323 Latham Drive, Dallas, Tex. 75229
Filed July 19, 1971, Ser. No. 164,207
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 R

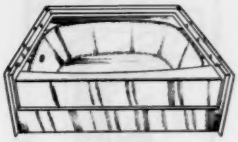


230,269
SOLAR BUILDING BLOCK
Bernice W. Shuey, 3323 Latham Drive, Dallas, Tex. 75229
Filed July 19, 1971, Ser. No. 164,208
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 R



230,270
WATERFOWL DECOY
Kenneth M. Gagnon, 302 Reservoir Ave., Lincoln, R.I. 02865
Filed Dec. 26, 1972, Ser. No. 318,559
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—21

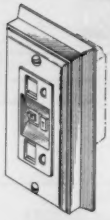
230,271
BATHTUB
Harold H. Weiss, 56 Dorian Way, San Rafael, Calif. 94901
Continuation-in-part of design application Ser. No. 218,646, Jan. 17, 1972, now Patent No. 227,100, dated June 5, 1973. This application Apr. 2, 1973, Ser. No. 347,196
Term of patent 14 years
The portion of the term of the patent subsequent to June 5, 1987, has been disclaimed
Int. Cl. D23—*02*
U.S. Cl. D23—55



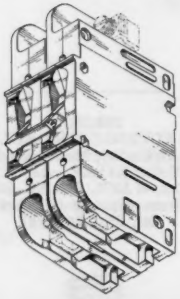
230,272
THREE-WAY DENTAL SYRINGE
George F. Bueckle, 1021 Laguna Ave., Burlingame, Calif. 94010
Filed Mar. 16, 1973, Ser. No. 342,273
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1 D

230,273
ELECTRIC LIGHT BULB
Jack N. McCarthy, Meadowood Road, Tolland, Conn. 06084
Filed Oct. 4, 1971, Ser. No. 186,573
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—8

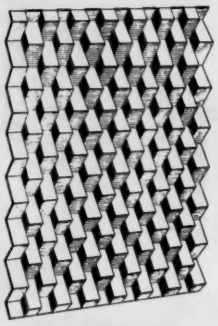
230,274
COMBINED GROUND FAULT INTERRUPTER AND RECEPTACLE WITH MOUNTING FRAME
Arthur J. Pulos, Syracuse, N.Y., assignor to Pass & Seymour, Inc., Syracuse, N.Y.
Filed Dec. 27, 1972, Ser. No. 319,013
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

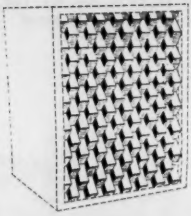


230,275
CIRCUIT BREAKER CASE
Charles Mune, Trenton, N.J., assignor to Heineman Electric Company, Trenton, N.J.
Filed Aug. 2, 1971, Ser. No. 168,534
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

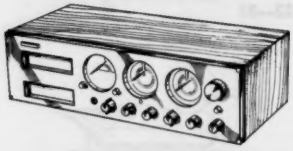


230,276
COVERING FOR A LOUDSPEAKER ENCLOSURE
Gordon L. Duern, Kitchener, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada
Filed Sept. 17, 1971, Ser. No. 181,656
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D26—14 G



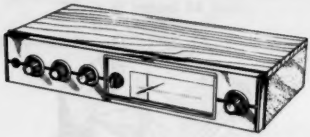


230,277
AMPLIFIER
Masaaki Miyamoto and Kikuo Ohta, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed June 18, 1973, Ser. No. 371,237
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 L

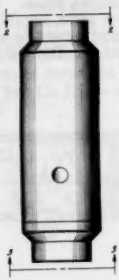


230,278
AMPLIFIER
Katsuhiko Makino and Hironosuke Koda, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed June 18, 1973, Ser. No. 371,239
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 L

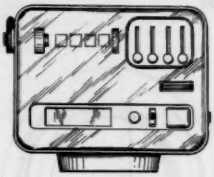
230,279
AMPLIFIER
Takeyoshi Kawano, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed June 18, 1973, Ser. No. 371,236
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 L



230,280
HOUSING FOR AN ARTIFICIAL EAR
Clifford A. Nygard, Phoenix, Ariz., assignor to Royal Industries, Inc., Pasadena, Calif.
Filed Jan. 17, 1972, Ser. No. 218,649
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 H



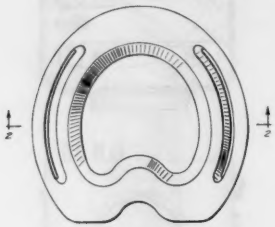
230,281
COMBINED STEREO TAPE PLAYER RECEIVER AND DIGITAL CLOCK
Michio Tatsuta, Tokyo, Japan, assignor to Tokyo Trading Co., Ltd., Tokyo, Japan
Filed Mar. 8, 1973, Ser. No. 339,253
Term of patent 14 years
Int. Cl. D14—*03*; D10—*01*
U.S. Cl. D26—14 B



230,282
FIGURINE
Jimmy J. Johnson, Rte. 3, Box 533, Wichita Falls, Tex. 76308
Filed May 24, 1972, Ser. No. 256,638
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 B

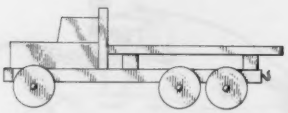
230,283
FIGURINE
Jimmy J. Johnson, Rte. 3, Box 533, Wichita Falls, Tex. 76308
Filed May 24, 1972, Ser. No. 256,637
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 A

230,284
HORSESHOE
Christopher Stephen Shenton, Suite 203T, 550 Cottonwood Drive, Coquitlam, British Columbia, Canada, and Michael David Cox, 16106 84th Ave., Surrey, British Columbia, Canada
Filed Mar. 31, 1972, Ser. No. 240,341
Claims priority, application Canada Mar. 30, 1972
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—35



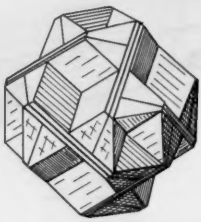
230,285
COMBINED LITTER PAN AND COVER THEREFOR FOR CATS
John A. Dilley, P.O. Box 3207, Champaign, Ill. 61820
Filed May 8, 1972, Ser. No. 251,555
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99

230,286
TOY FLATBED TRUCK
Robert E. De Graw, 13811 116th Ave. NE., Kirkland, Wash. 98033
Filed Nov. 27, 1972, Ser. No. 309,781
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



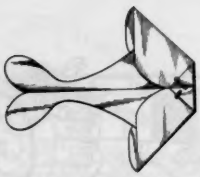
230,287
TOY LOGGING TRUCK
Robert E. De Graw, 13811 116th Ave. NE., Kirkland, Wash. 98033
Filed Nov. 27, 1972, Ser. No. 309,782
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

230,288
SYMMETRICAL POLYHEDRAL INTERLOCKING PUZZLE
Stewart T. Coffin, Old Sudbury Road, Lincoln, Mass. 01773
Filed Feb. 28, 1972, Ser. No. 230,197
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M

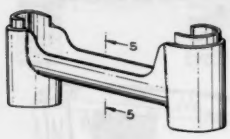


230,289
COMBINED TOY TRUCK AND WOOD CHIPPER
Elaine Ouellet, 3 Oakmont Ave., Westminster, Mass. 01473
Filed Aug. 4, 1972, Ser. No. 277,894
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

230,290
TOY AIRPLANE
Irvin L. Fields, P.O. Box 1083, Ormond Beach, Fla. 32074
Filed Aug. 2, 1972, Ser. No. 277,238
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



230,291
MARBLE RUNWAY
Thomas Josef Derrick Paul Karen, Ashwell, England, assignor to Hilary Page "Sensible" Toys Limited, Kenley, Surrey, England
Filed Apr. 27, 1972, Ser. No. 248,343
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 K

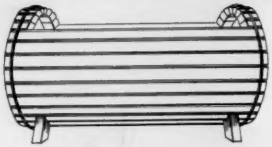


230,292
PUTTER
Rudolph A. Gall, 7800 Webster Road, Middleburg Heights, Ohio 44130
Filed June 22, 1972, Ser. No. 265,186
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

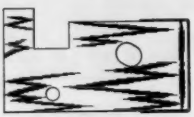
230,293
PUTTER
Rudolph A. Gall, 7800 Webster Road, Middleburg Heights, Ohio 44130
Filed June 22, 1972, Ser. No. 265,187
Term of patent 14 years
The portion of the term of the patent subsequent to Feb. 5, 1988, has been disclaimed
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

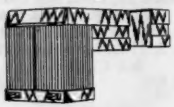
230,294
PUTTER
Rudolph A. Gall, 7800 Webster Road, Middleburg Heights, Ohio 44130
Filed June 22, 1972, Ser. No. 265,188
Term of patent 14 years
The portion of the term of the patent subsequent to Feb. 5, 1988, has been disclaimed
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

230,295
PLANTER FOR FLOWERS
Wallace Rosenwach, 2 Harbour Road, Great Neck, N.Y. 11024
Filed Nov. 11, 1971, Ser. No. 198,037
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



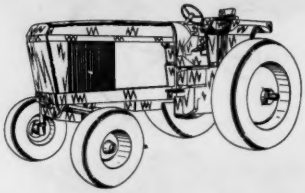
230,296
COMBINED HOOD AND GRILLE FOR A SELF-PROPELLED FORAGE HARVESTER OR THE LIKE
Joe P. Leinhauser and James L. Vogt, Ottumwa, Iowa, and James M. Conner, Mamaroneck, and Charles W. Pelly, Scarsdale, N.Y., assignors to Deere & Company, Moline, Ill.
Filed Mar. 28, 1972, Ser. No. 238,998
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D40—1 E



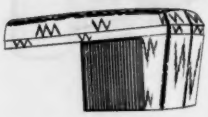


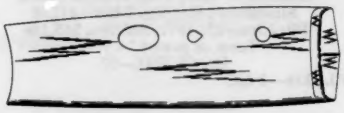
230,297
TRACTOR ROLL-OVER PROTECTION FRAME
William F. H. Purcell, New York, James M. Conner, Mamaroneck, and Charles W. Pelly, Scarsdale, N.Y., assignors to Deere & Company, Moline, Ill.
Filed Mar. 22, 1972, Ser. No. 237,227
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D40—5

230,298
TRACTOR
William F. H. Purcell, New York, James M. Conner, Mamaroneck, Charles W. Pelly, Scarsdale, and Niels Diffrient, New York, N.Y., assignors to Deere & Company, Moline, Ill.
Filed Mar. 22, 1972, Ser. No. 237,225
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D40—5

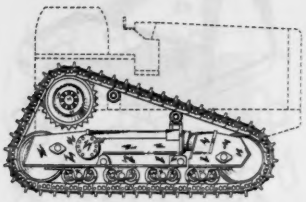


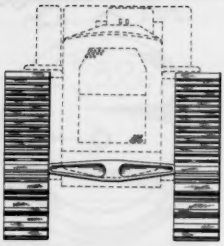
230,299
COMBINED TRACTOR HOOD AND GRILLE
William F. H. Purcell, New York, James M. Conner, Mamaroneck, Niels Diffrient, New York, and Charles W. Pelly, Scarsdale, N.Y., assignors to Deere & Company, Moline, Ill.
Filed Mar. 22, 1972, Ser. No. 237,224
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D40—5



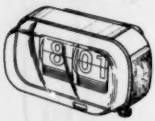


230,300
TRACK ASSEMBLY
Eldon D. Oestmann, Washington, Ronald L. Krolak, Metamora, George F. Alexander, Pekin, and James T. Duke, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Aug. 23, 1972, Ser. No. 283,066
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D40—5





230,301
DIGITAL CLOCK OR SIMILAR ARTICLE
Hideaki Nagata, Tokyo, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan
Filed Aug. 1, 1972, Ser. No. 277,036
Claims priority, application Japan Feb. 2, 1972
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7 R

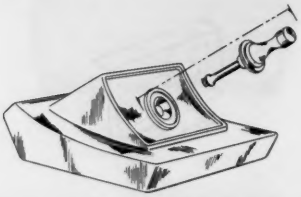


230,302
CLOCK OR SIMILAR ARTICLE
Jiro Ochiai, Yokohama, and Tatsuhiko Machida, Chiba, Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan
Filed Feb. 11, 1972, Ser. No. 225,709
Claims priority, application Japan Aug. 13, 1971
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7 R

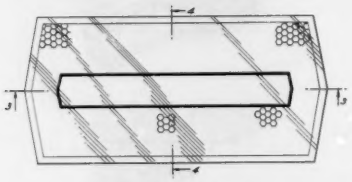
230,303
STAMPED BEARING ASSEMBLY
Vincent C. Wachter, Milford, Joseph R. Keller, Fairfield, and Frederick J. Feldmann, Stratford, Conn., assignors to MPB Corporation, Keene, N.H.
Filed Aug. 27, 1971, Ser. No. 175,800
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D46—1 R

230,304
LAMP BASE
John Sara, 5825 N. Rogers Ave., Chicago, Ill. 60646
Filed Jan. 17, 1973, Ser. No. 324,317
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

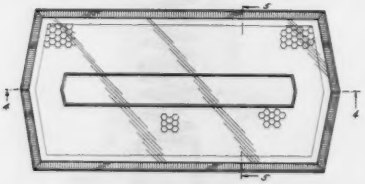
230,305
CIGARETTE LIGHTER
Samuel J. Koch, % Korex Industries, 821 Malcolm Road, Burlingame, Calif. 94010
Continuation-in-part of design application Ser. No. 211,838, Dec. 23, 1971. This application Nov. 9, 1972, Ser. No. 304,958
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27 R



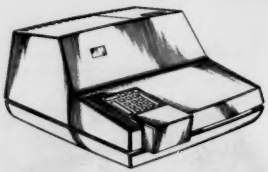
230,306
LENS
John Smith, Willowdale, Ontario, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Feb. 4, 1972, Ser. No. 223,812
Claims priority, application Canada Aug. 13, 1971
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A



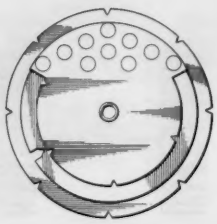
230,307
LENS
John Smith, Willowdale, Ontario, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Feb. 4, 1972, Ser. No. 223,813
Claims priority, application Canada Aug. 13, 1971
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A



230,308
ELECTRONIC CASH REGISTER
Lynton Randolph Knapp, Orange, and Ralph Waldo Province, Westminster, Calif., assignors to MSI Data Corporation, Costa Mesa, Calif.
Filed Feb. 10, 1972, Ser. No. 225,365
Term of patent 14 years
Int. Cl. D18—*01*; D14—*02*
U.S. Cl. D52—4 A

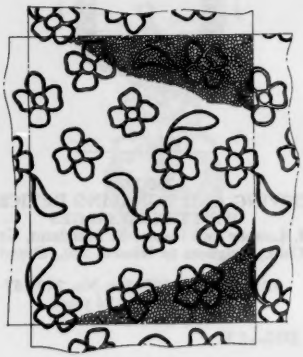


230,309
ROTARY SLIDE RULE CALCULATOR
Allen R. Herron, Los Angeles, Calif. (17656 Orna Drive, Granada Hills, Calif. 91344)
Filed June 21, 1972, Ser. No. 264,806
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D52—6 B

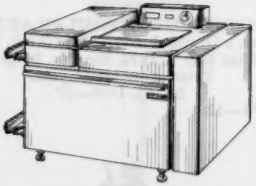


230,310
SHOULDER REST FOR A STRINGED MUSICAL INSTRUMENT
Walter James Stewart, 45 Kenilworth Gardens, Westcliff, Southend, Essex, England
Filed Aug. 16, 1971, Ser. No. 172,355
Claims priority, application Great Britain Apr. 8, 1971
Term of patent 3½ years
Int. Cl. D17—*99*
U.S. Cl. D56—1

230,311
EMBOSSED PAPER TOWEL
Robert Y. Kimura, Dobbs Ferry, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed June 9, 1972, Ser. No. 261,579
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 B

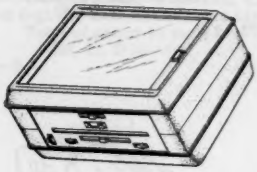


230,312
ELECTROSTATIC COPIER
Richard H. Penny, New York, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Sept. 25, 1972, Ser. No. 291,662
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



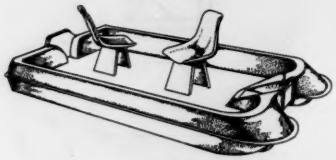
230,313
REAR PROJECTION VIEWER
Mikio Sakata and Masao Kobayashi, Nagoya, Japan, assignors to Elmo Company Limited, Nagoya, Japan
Filed July 3, 1972, Ser. No. 268,871
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 N

230,314
MICROFICHE READER
Hideto Furuoka, Tokyo, Japan, assignor to Gakken Co., Ltd., Tokyo, Japan
Filed Nov. 6, 1972, Ser. No. 304,233
Claims priority, application Japan May 6, 1972
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 N

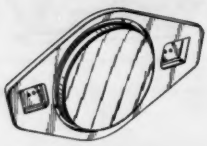


230,315
REFRIGERATOR
Abraham Hoffbrand Bank, 2 Greenacres Drive, Birdhaven, Johannesburg, Transvaal, Republic of South Africa
Filed Oct. 12, 1972, Ser. No. 296,815
Claims priority, application Republic of South Africa Apr. 18, 1972
Term of patent 7 years
Int. Cl. D15—*07*
U.S. Cl. D67—3 R

230,316
TWIN HULL BOAT
Richard B. Hull, % Midland Fiberglass Co., Box 5714, Midland, Tex. 79701
Filed Feb. 28, 1972, Ser. No. 230,209
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 Q



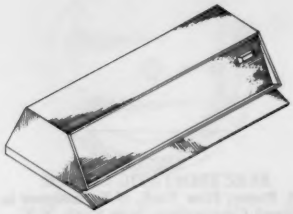
230,317
REFLECTOR FOR SPOKED WHEELS
Henry Lindner, Wood Dale, Ill., assignor to Beatrice Foods Co., Chicago, Ill.
Filed Feb. 22, 1972, Ser. No. 228,476
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D72—1 F



230,318
DOG WHISTLE
Claud W. Kissin, Fort Lee, N.J., assignor to The Hartz Mountain Corporation, Harrison, N.J.
Filed June 23, 1972, Ser. No. 265,819
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1 A

230,319
REFLECTIVE ROADWAY MARKER
Howard A. Schaefer, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Sept. 21, 1972, Ser. No. 290,820
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D72—1 J

230,320
RECEIVING AND SIGNALING DEVICE FOR WRITTEN MESSAGES
Dennis J. Lowery and Robert E. Merchant, Grand Junction, Colo., assignors to Dixson, Inc., Grand Junction, Colo.
Filed May 2, 1972, Ser. No. 249,757
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D74—1 R

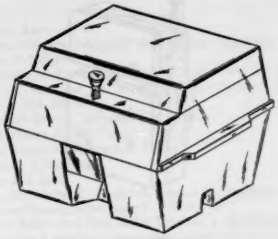


230,321
PAPERWEIGHT OR SIMILAR ARTICLE
Milton Laser, 1 Overlook Ave., Great Neck, N.Y. 11021
Filed July 7, 1972, Ser. No. 269,844
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—12

230,322
PAPERWEIGHT OR SIMILAR ARTICLE
Milton Laser, Great Neck, N.Y., assignor to Kurt S. Adler, Inc., New York, N.Y.
Filed July 7, 1972, Ser. No. 269,843
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—12

230,323
MUSCLE EXERCISE DEVICE
Saul Possick, 14 Boylston St., Randolph, Mass. 02368
Filed Apr. 6, 1973, Ser. No. 348,468
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 T

230,324
RADIOISOTOPE GENERATOR
John D. Wark, Freeport, and Henry A. Holzwarth, Bayside, N.Y., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.
Filed Aug. 26, 1971, Ser. No. 175,416
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 H

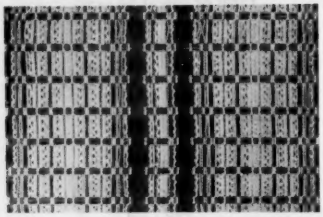


230,325
NURSING BOTTLE AND NIPPLE
Stephen B. Sofro, Providence, R.I., assignor to Reliance Products Corporation, Woonsocket, R.I.
Filed Sept. 28, 1971, Ser. No. 184,645
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—8 A

230,326
NIPPLE
Stephen B. Sofro, Providence, R.I., assignor to Reliance Products Corporation, Woonsocket, R.I.
Filed Sept. 28, 1971, Ser. No. 184,646
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—8 B

230,327
LUGGAGE BAG
Claire Cooperstein, 30 E. Hickory St., Spring Valley, N.Y. 10977
Filed Jan. 28, 1972, Ser. No. 221,849
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 G

230,328
WOVEN TEXTILE AND ALUMINUM FABRIC
Maurice Schaller, Clifton, N.J., assignor to Levolor Lorentzen, Inc., Hoboken, N.J.
Filed Oct. 22, 1971, Ser. No. 191,950
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 Y



230,329
SHAVER
Robert A. Mockovak, Newtown, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed May 30, 1972, Ser. No. 258,233
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

230,330
COLLAPSIBLE DISPENSING TUBE
John V. Massey, Chicago, and Robert J. Hutchcroft, Glen Ellyn, Ill., assignors to The Gillette Company, Boston, Mass.
Filed Nov. 16, 1971, Ser. No. 199,399
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—194

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF FEBRUARY, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. P. Engineering Kabushiki Kaisha: *See*—
Inuzuka, Keizo, 3,789,621.

Aalionen, Lasse; Salminen, Teuvo; and Vaisanen, Voitto, to Upo Osakeyhtio. Fountain well. 3,789,924, Cl. 166-105.100.

Aaltonen, Olavi A.: *See*—
Bryk, Petri B.; Honkasalo, Jorma B.; Malmstron, Rolf E.; Makipirtti, Simo A. I.; Toivanen, Toivo A.; and Aaltonen, Olavi A., 3,790,366.

Abbott Laboratories: *See*—
Flouret, George Rogelio, 3,790,554.
Flouret. George Rogelio; and Cole, John Wayne, 3,790,555.
Hirata, Arthur Atsunobu; and Boley, William Franklin, 3,790,447.
Theriault, Robert John; Karwowski, James Paul; and Wideburg, Norman Earl, 3,790,578.

Abex Corporation: *See*—
Swain, James C.; and Adams, Cecil B., 3,790,314.

Abramson, Carl N.; and Agusto, Nicholas A., III, to Adoptive Technology, Inc. Telephone communications system with distributed control. 3,790,717, Cl. 179-15.0al.

Absler, Howard K.: *See*—
Schnitzer, David H.; and Absler, Howard K., 3,790,070.

ACE Glass Co.: *See*—
Tausheck, Russell W., 3,790,003.

Acoustic Fiber Sound Systems, Inc.: *See*—
Everitt, Scott F., 3,789,953.

Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Tune keying and synthesizing system for electronic musical instrument. 3,790,693, Cl. 84-1.010.

Adahan, Carmeli. Brake pressure modulator. 3,790,228, Cl. 303-21.00f.

Adams, Cecil B.: *See*—
Swain, James C.; and Adams, Cecil B., 3,790,314.

Adams, John Walker. Stand for motorcycle wheels. 3,789,894, Cl. 144-288.00a.

Adams, Phillip: *See*—
Merianos, John J.; Shay, Edward Griffin; Adams, Phillip; and Petrocci, Alfonso N., 3,790,678.

Adams, Stanley B.: *See*—
Jorgensen, Stanley A.; and Adams, Stanley B., 3,789,946.

Adamson, Gerald P., to Dresser Industries, Inc. Circuit for suppression of spurious pulses resulting from relay operation. 3,790,821, Cl. 307-247.00a.

Adoptive Technology, Inc.: *See*—
Abramson, Carl N.; and Agusto, Nicholas A., III, 3,790,717.

Advanced Memory Systems, Inc.: *See*—
Palfi, Thomas L.; Brooks, Charles; and Miller, George J., 3,790,961.

Afanasiev, Alexandr Dmitrievich; Lykov, Alexei Gavrilovich; Mogilevsky, Alexandr Moiseevich; Sokolov, Leonid Pavlovich; and Fridman, Evl Gershkovich. Apparatus for transferring the blanks of knitting needles in the process of manufacture of such needles. 3789,974, Cl. 198-20.000.

AGA Aktiebolag: *See*—
Bostrom, Bertil Ingemar; Ljungsahl, Soren Folkl Samuel; and Knoos, Stellan, 3,789,494.

Agfa-Gevaert Aktiengesellschaft: *See*—
Werz, Siegfried; and Zanner, Johann, Jr., 3,790,263.

Agfa-Gevaert N.V.: *See*—
Smets, George Joseph; and Vandensavel, Jean Marie, 3,790,377.

Agladze, Ilich: *See*—
Demuria, Nazi Vladimirovna; and Agladze, Ilich, 3,790,458.

Agon Uhrenfabrik Robert Triebold AG: *See*—
Hurt, Zeno, 3,789,604.

Aguet, Emilt, to Sulzer Brothers Limited. Steam power plant with a flame-heated steam generator and a group of gas turbines. 3,789,804, Cl. 122-1.00r.

Agusto, Nicholas A., III: *See*—
Abramson, Carl N.; and Agusto, Nicholas A., III, 3,790,717.

Ahrens, Erhard, to Electroacustic GmbH. Echo-sounding apparatus having a digital intermediate store. 3,790,925, Cl. 340-3.00r.

Aichenegg, Paul C.; and Emerson, Carl D., to Baychem Corporation, mesne. Unsaturated sulfur-containing nematocides and fungicides. 3,790,683, Cl. 424-337.000.

Aileo, Jackson Anthony. Headgear structure. 3,789,427, Cl. 2-3.00r.

Air Products and Chemicals, Inc.: *See*—
Weintraub, Lester, 3,790,460.

Ajax Magnethermic Corporation: *See*—
Duca, William J., 3,790,338.

Akamatsu, Mitsuhiro: *See*—
Inoue, Komei; Yorisue, Kazumi; and Akamatsu, Mitsuhiro, 3,789,968.

Akima, Shinobu: *See*—
Mishimura, Shojiro; Ishizaki, Masao; Seo, Yoshiro; and Akima, Shinobu, 3,789,930.

Akiyama, Hideaki, to Kabushiki Kaisha Ricoh. Cleaning liquid purification device for use in wet-type electrostatic photography. 3,790,466, Cl. 204-300.000.

Aktiengesellschaft Brown, Boveri & Cie: *See*—
Endres, Wilhelm, 3,790,303.

Akticselskabet Brodrene Hartmann: *See*—
Moller, Bent, 3,790,063.

Akustikobyran AB: *See*—
Egerbork, Bo Malte S.; Gadefelt, Goran R.; Hagbjer, Gunnar Ingemar; and Spang, Kjett Knut I., 3,790,078.

Albrecht, Harry Allen; and Plati, John Thomas, to Hoffmann-La Roche Inc. Intermediate 4-methoxy isoxazoles. 3,790,591, Cl. 260-307.00h.

Aldea, Alexandru: *See*—
Radu, Gheorghe; and Aldea, Alexandru, 3,790,187.

Aldinger, Ulrich, to Bosch, Robert, G.m.b.H. Flow control arrangement for a piston pump. 3,790,307, Cl. 417-270.000.

Alexander, Arthur Duane. Pulse analyzing tester. 3,790,767, Cl. 235-151.310.

Alexander, Delbert S., Jr., to Small Business Administration, mesne. Automatic electric baseball game. 3,790,170, Cl. 273-88.000.

Alexander, Edward M., to United States of America, Navy. Lattice softening variable delay line. 3,790,907, Cl. 333-30.00r.

Alexoff, Peter, to Mitchell, George A., Company. Method for forming reduced diameter ends on elongated workpieces. 3,789,650, Cl. 72-360.000.

Allemang, Arnold A.; and Bachtel, Howard J., to Dow Chemical Company, The. Removal of phosgene from an essentially anhydrous gas stream. 3,789,580, Cl. 55-71.000.

Allenspach, Heinz: *See*—
Strobel, Felix; and Allenspach, Heinz, 3,789,937.

Allied Chemical Corporation: *See*—
Beller, Herbert R., 3,790,099.
Bruen, Charles Patrick; Wamser, Christian Albert; and Morgan, Thomas Richard, 3,790,456.
Lichstein, Bernard Murray, 3,790,607.

Allis-Chalmers Corporation: *See*—
Hansen, Kenneth N., 3,789,945.
Haupt, Robert C., 3,789,694.
Leveraus, James E., 3,790,931.

Allis-Chalmers Manufacturing Company: *See*—
Heian, Glenn A., 3,790,323.

Allmanna Svendka Elektriska Aktiebolaget: *See*—
Isaksson, Sven-Erik; Larker, Hans; and Lindberg, Mats, 3,790,340.

Allmanna Svenska Elektriska Aktiebolaget: *See*—
Larker, Hans; Isaksson, Sven-Erik; Lindberg, Mats; and Granberg, Gunnar, 3,790,339.
Nilsson, Jan, 3,789,642.

Allweiler AG: *See*—
Volz, Hermann, 3,790,309.

Aluminum Company of America: *See*—
Anderson, William A.; and Franz, Edmund C., 3,790,452.
Clowes, Ernest J., 3,789,649.
Snodgrass, Robert H.; Carter, James R.; and Edstrom, Carl M., 3,789,497.

Alvarez, Vicente. Handle connection. 3,790,232, Cl. 403-192.000.

Alverson, Robert M.: *See*—
Best, Albert M.; and Alverson, Robert M., 3,789,593.

AMBAC Industries, Incorporated: *See*—
Cole, Frederic W., 3,789,498.

Amdahl Corporation: *See*—
Amdahl, Gene M.; Clements, Michael R.; and Topham, Lyle C., 3,790,960.

Amdahl, Gene M.; Clements, Michael R.; and Topham, Lyle C., to Amdahl Corporation. Right and left shifter and method in a data processing system. 3,790,960, Cl. 340-172.500.

Amerace Esna Corporation: *See*—
Heenan, Sidney A.; and Majewski, Norbert, 3,790,293.

American Can Company: *See*—
Bowen, William Edmund, 3,790,744.

American Cyanamid Company: *See*—
Asato, Goro; Berkelhammer, Gerald; and Gastrock, William Henry, 3,790,589.
Economou, Peter, 3,790,514.
Panzer, Hans Peter; and McAdams, Louis Vincent, 3,790,537.
Remers, William Alan; Gibs, Gabriel Joseph; and Weiss, Martin Joseph, 3,790,590.

Yang, Chang-Tsing, 3,790,637.
American Locker Company, Inc.: *See—*
Stackhouse, Wells F., 3,790,244.
American Optical Corporation: *See—*
Rybicki, Edward B.; Sussman, Milton H.; and Tackaberry, Robert B., 3,790,254.
Shoemaker, Arthur H., 3,790,255.
American Petroscience Corporation: *See—*
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 3,790,930.
American Safety Equipment Corporation: *See—*
Littmann, Joseph C., 3,790,209.
American Science & Engineering Inc.: *See—*
Montgomery, Marshall A.; Thier, Herbert D.; and Oreli, John D., 3,789,519.
Orfei, John B., 3,789,799.
Paolini, Frank; and Kuhnel, Alfred, 3,790,785.
Stein, Jay A.; and Polucci, Gerald, 3,790,799.
American Standard, Inc.: *See—*
Herbert, Michael B., 3,789,561.
Rae, Jerry W.; and White, Dean S., 3,789,567.
Ames, Ward A., to Tridan Tool & Machine, Inc. Portable tube expander. 3,789,648, Cl. 72-316.000.
Ametek, Inc.: *See—*
Gilliland, Michael L., 3,790,300.
Amici, Francesco: *See—*
Brugnoli, Angelo, 3,789,433.
AMP Incorporated: *See—*
Coller, James Ray, 3,789,481.
Anderson, Clarence. Left and right trip dogs for carrier tracks. 3,789,695, Cl. 74-568.00r.
Anderson, Dennis. Combination roof and side wall extensions for vehicular hauling beds. 3,790,207, Cl. 296-23.00g.
Anderson, Donald J., to Chevron Research Company. Hexahydro-o-xylylene compounds and process for their production. 3,790,643, Cl. 260-648.00r.
Anderson, Leonard R. Tether ball apparatus including roller bearing and vertical barrier. 3,790,171, Cl. 273-95.00a.
Anderson, Matthew E.; and Means, James E., to United States of America, Navy. Optical accelerometer. 3,789,674, Cl. 73-517.00r.
Anderson, Norman Richard, to Bunker Ramo Corporation. Optoelectronic cable assembly. 3,790,791, Cl. 250-227.000.
Anderson, Richard W.; Weiss, Bernard J.; and Hulley, Hubert E., to Cygned, Inc. Moving target indicator system and apparatus. 3,790,938, Cl. 343-7.700.
Anderson, William A.; and Franz, Edmund C., to Aluminum Company of America. Silicon-manganese aluminum base architectural alloy. 3,790,452, Cl. 204-29.000.
Andreassen, Victor Paul, to Smidth, F. L., & Co. Lined coolers for rotary kilns. 3,790,335, Cl. 432-80.000.
Andreichev, Pavel Petrovich. Reactor for catalyst preparation. 3,790,349, Cl. 23-284.000.
Andrews, Robert R.: *See—*
Lighthipe, Charles H., Jr.; and Andrews, Robert R., 3,790,204.
Andrews, Theodore E.: *See—*
Snelling, Charles D.; Andrews, Theodore E.; and Weller, John J., 3,790,320.
Andrianov, Vladimir Rubenovich: *See—*
Lipshits, Viktor Senderovich; Andrianov, Vladimir Rubenovich; Rykalin, Nikolai Nikolaevich; Krasnev, Tibor Ferentsevich; Podola, Nikolai Vasilievich; and Krivonos, Vadim Petrovich, 3,790,739.
Andries, Francis M., to Computer Medical Science Corporation. Electronic stethoscope system. 3,790,712, Cl. 179-1.0st.
Annal, James M., to Fahralloy Company, The. Hangers for porcelain enamelling furnaces. 3,789,995, Cl. 211-113.000.
Anthony, Michael: *See—*
Kurtin, Stephen; Anthony, Michael; and Watrous, Willis, 3,790,886.
Antoshkiw, William T., to Becton, Dickinson & Company. Disposable guide wire. 3,789,841, Cl. 128-2.050.
Ao, Hideki: *See—*
Nakanishi, Michio; Arimura, Katsuo; and Ao, Hideki, 3,790,579.
Apeco Corporation: *See—*
Smoot, Charles W.; and Saldenais, Arvids, 3,790,274.
Appleby, Harry: *See—*
Cowland, Frederick Claud; and Appleby, Harry, 3,790,393.
Applied Synthetics Corporation: *See—*
Silverstein, Paul, 3,789,710.
Aqua Therm Products Corporation: *See—*
Tobinick, Sidney, 3,789,442.
Aratani, Norio; and Nakano, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Helmet chin strap. 3,789,467, Cl. 24-230.0at.
Arbman Development AB: *See—*
Ericsson, Konrad E., 3,790,161.
Arctic Enterprises, Inc.: *See—*
Hetteen, Edgar E., 3,789,938.
Argus Gesellschaft mbH: *See—*
Hempelmann, Wilhelm; Waldenmeier, Gunter; and Kienhofer, Manfred, 3,790,128.
Arimura, Katsuo: *See—*
Nakanishi, Michio; Arimura, Katsuo; and Ao, Hideki, 3,790,579.
Arita, Masujiro: *See—*
Sato, Hiroshi; Okumura, Munehiro; and Arita, Masujiro, 3,790,497.
Ariyan, Zaven S.; and Ma, Shih-Yu, to Uniroyal, Inc. 2-(-Benzo[b]thenyl)-2-thiopseudorea and its pharmaceutically acceptable salts. 3,790,600, Cl. 260-330.500.
ARK-Environmental Research Inc.: *See—*
De Chicchis, Antoni; Fennell, Harry C., Jr.; and Schwartz, David M., 3,789,562.
Armstrong Cork Company: *See—*
Boylan, Joseph W.; and Shenk, John W., 3,789,566.
Graham, Andrew E., Jr.; and Sitler, Rickie L., 3,790,436.
Armstrong Cork Company, mesne: *See—*
Snelling, Charles D.; Andrews, Theodore E.; and Weller, John J., 3,790,320.
Armstrong, Dan F.; and Armstrong, George F., to Chem Valley Machine, Inc. Porous metal flow control spool. 3,789,880, Cl. 137-625.300.
Armstrong, George F.: *See—*
Armstrong, Dan F.; and Armstrong, George F., 3,789,880.
Armstrong, John C.; and Lyman, George F., to Armstrong-Kropp Development Corporation. Breath-actuated aerosol dispenser. 3,789,843, Cl. 128-173.000.
Armstrong-Kropp Development Corporation: *See—*
Armstrong, John C.; and Lyman, George F., 3,789,843.
Arnegard, Bo Olof Roland: *See—*
Emanuelsson, Kaj Bengt Ingemar; and Arnegard, Bo Olof Roland, 3,790,315.
Arnold, Orlan M.; and Vancini, Carlo A., to Peabody Engineering Corporation. Apparatus for cleaning gases. 3,789,585, Cl. 55-222.000.
Arnold, Orlan M.; and Vancini, Carlo A., to Peabody Engineering Corporation. Apparatus for removing surface films from liquids. 3,789,586, Cl. 55-228.000.
Arnold, Robert J.: *See—*
Gattuso, Marion J.; and Arnold, Robert J., 3,790,534.
Arthur, Jett C., Jr.; and Bains, Malkiat S., to United States of America, Agriculture. Methy cellulose-boron alkoxide compounds. 3,790,562, Cl. 260-231.00r.
Artos Engineering Company: *See—*
Gudmestad, Ragnar, 3,789,485.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kominami, Naoya; Tamura, Nobuhiro; Mikami, Hiroshi; and Yamamoto, Etsuo, 3,790,642.
Nakano, Hiroshi; Takai, Hideo; and Nakajima, Fumio, 3,789,461.
Asano, Kazuo: *See—*
Oga, Shunichiro; Sato, Kiyoshi; Imada, Katsumi; and Asano, Kazuo, 3,790,444.
Asano, Usamu: *See—*
Tanimura, Shigeru; Miura, Nobuaki; Asano, Usamu; and Yamamura, Nobuyuki, 3,790,869.
Asato, Goro; Berkelhammer, Gerald; and Gastrock, William Henry, to American Cyanamid Company. Substituted 5-nitroimidazoles and method of preparing the same. 3,790,589, Cl. 260-306.80d.
Asbery, John Harrison; and Fenne, Ivor, to C.A.V. Limited. Fuel injection systems. 3,789,818, Cl. 123-139.0am.
Ashall, Ronald James, to Fibreglass Limited. Binders for glass fiber insulation. 3,790,441, Cl. 161-198.000.
Ashall, Ronald James, to Fibreglass Limited. Binders for glass fiber insulation. 3,790,442, Cl. 161-198.000.
Askew, Anthony A., to Ecodyne Corporation. Hot process unit. 3,789,578, Cl. 55-39.000.
Astafiev, Georgy Vasilievich: *See—*
Razgulov, Mikhail Mikhailovich; Astafiev, Georgy Vasilievich; and Korolkov, Ivan Alexandrovich, 3,790,057.
Ateliers G.S.P. (Guillemin, Sergot, Pegard): *See—*
Pegard, Pierre, 3,789,472.
Atlas Capco Aktiebolag: *See—*
Schoeps, Knut Christian; and Karden, Karl Gosta, 3,789,934.
Atlas Copco Aktiebolag: *See—*
Emanuelsson, Kaj Bengt Ingemar; and Arnegard, Bo Olof Roland, 3,790,315.
Attix, Frank H.: *See—*
Murray, Kenneth M.; and Attix, Frank H., 3,790,794.
Atwell, William J.; and Cranston, Lawrence, to Uniroyal Inc. Method of making textile-reinforced all-polymeric hose. 3,790,419, Cl. 156-149.000.
Auer, Rupert, to Messer Griesheim G.m.b.H. Nozzle. 3,790,742, Cl. 219-121.00p.
Aumuller, Walter: *See—*
Weyer, Rudi; Aumuller, Walter; Weber, Helmut; Muth, Karl; and Schmidt, Felix Helmut, 3,790,630.
Aupy, Roland Rolland, to Etat Francois represente Pai le Ministre d'Etat Sharge de la, Defense Nationale Delegation. Apparatus and method for the storage and launching of a missile. 3,789,729, Cl. 89-1.800.
Autoflow Engineering, Limited: *See—*
Craxton, Robert Trevor, 3,790,875.
Automation Gages, Incorporated: *See—*
Polidor, Edward C., 3,790,233.
Automobiles Peugeot: *See—*
Tixier, Michel, 3,790,771.
Avco Corporation: *See—*
Hohenberg, Rudolph, 3,789,665.
Avilzer, Zvi: *See—*
Bowerfind, Albert L.; and Avilzer, Zvi, 3,789,533.
AVM Corporation: *See—*
Moldovan, Michael Terrance, Jr., 3,790,072.
Avramenko, Vladimir Grigorievich: *See—*

Suvorov, Nikolai Nikolaevich; Avramenko, Vladimir Grigorievich; Shkilkova, Valentina Nikolaevna; and Zamyshlyaeva, Lidia Ionovna, 3,790,596.

Ayer, Lloyd M., to High Precision Incorporated. Safety nozzle for air blow-guns. 3,790,085, Cl. 239-291.000.

Azadian, Genevieve: *See—*
Pierdet, Andre; and Azadian, Genevieve, 3,790,564.

B/J Manufacturing Co. Inc.: *See—*
Neier, Benjamin R., 3,790,138.

Babington, Robert S. Method of spraying. 3,790,080, Cl. 239-8.000.

Bachner, Ernst, to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft. Process for continuous casting of hot liquid metals. 3,789,911, Cl. 164-82.000.

Bachtel, Howard J.: *See—*
Allemang, Arnold A.; and Bachtel, Howard J., 3,789,580.

Backer, Martin A. Extruding flower designs. 3,790,331, Cl. 425-464.000.

Backowski, Henry J. Vehicle stabilizing means and method. 3,790,206, Cl. 296-15.000.

Bacon, Patrick Albert Henry: *See—*
Collomosse, Herbert; and Bacon, Patrick Albert Henry, 3,790,704.

Bader, Horst, to Eckardt, J. C., AG. Pneumatic pressure position adjusting controller. 3,789,884, Cl. 137-832.000.

Bader, Jorg; and Gatzi, Karl, to Ciba-Geigy Corporation. Control of phytopathogenic fungi with 3-arylimino-1,2 dithiols. 3,790,677, Cl. 424-277.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Graser, Fritz; and Bock, Gustav, 3,790,603.
Trieschmann, Hans-Georg; Pfanmueller, Helmut; and Zeitler, Gerhard, 3,790,548.

Baglai, Vitaly Mikhailovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georievich, 3,790,691.

Bagley, Rodney D., to Corning Glass Works. Extrusion method for forming thin-walled honeycomb structures. 3,790,654, Cl. 264-177.000.

Bahr, Siegmund; and Saur, Walter, to Fr. Hesser Maschinenfabrik AG. Worm metering device with shut-off mechanism. 3,790,040, Cl. 222-413.000.

Baier, Webasto-Werk W., KG: *See—*
Schmid, Alfred, 3,789,645.

Bailey, Isabel W. Plastic container with disposable inner container. 3,790,021, Cl. 220-63.00r.

Bailey, Keith A.; and Marlow, Jerry R., to General Motors Corporation. Transmission control system. 3,789,963, Cl. 192-3.570.

Bailey, Ronald B., to General Electric Company. Power delivery system for a tank load characterized by series-connected inverter bridges and a high voltage source. 3,790,877, Cl. 321-27.00r.

Bains, Malkiat S.: *See—*
Arthur, Jett C., Jr.; and Bains, Malkiat S., 3,790,562.

Baker, John R.; and Fox, George, to Ford Motor Company. Resiliently biased control linkage. 3,789,693, Cl. 74-513.000.

Baker, Joseph W.: *See—*
Schumacher, Ignatius; and Baker, Joseph W., 3,790,649.

Baldwin, D. H., Company: *See—*
Bunger, David A., 3,789,718.

Baldwin, Richard R., to Hewlett-Packard Company. Interferometer system for measuring straightness and roll. 3,790,284, Cl. 356-106.000.

Ball Corporation: *See—*
Lind, Archie L., 3,790,022.
Mahoney, William P., 3,789,628.

Ballou, Richard P., to General Motors Corporation. Garnish button assembly. 3,790,199, Cl. 292-336.300.

Baltz, Albert L.; and Voeke, Elmer E., to Eagle Range and Manufacturing Company. Runner construction for oven rack. 3,789,826, Cl. 126-33.900.

Bandrowski, James F. Ski construction. 3,790,184, Cl. 280-11.13j.

Bannister, Brian, to Upjohn Company, The. Derivatives of lincomycin and its analogs and process. 3,790,560, Cl. 260-210.00r.

Banyas, John D.; and Ross, Edward A., to Owens-Illinois, Inc. Burner apparatus for forming a finish on a glass container. 3,790,087, Cl. 239-418.000.

Barabas, Andrew, to Castro Convertible Corporation. Dutton assembling device and method. 3,789,496, Cl. 29-453.000.

Barbarin, Jean Francois: *See—*
Mesnet, Jean Dominique Francois; Remon-Beauvais, Philippe Marie Antoine Jacques; Barbarin, Jean Francois; Le Guennec, Raymond Louis; and Daddon, Georges Edouard Louis Leon, 3,790,111.

Barbecue Ovens, Inc.: *See—*
Mason, William B., 3,789,824.

Barenyi, Bela, to Daimler-Benz Aktiengesellschaft. Motor vehicle front end construction. 3,789,944, Cl. 180-68.00p.

Baring, John A., to Honeywell Inc. Electron beam tube with moving display or memory. 3,790,851, Cl. 315-22.000.

Barker, John: *See—*
Montague, Bernard R.; Leyburn, Derek; Barker, John; Hannley, Ray John; Leblanc, Vincent G.; and Tam, Leslie K., 3,790,719.

Barkey, Kenneth T.; Gandy, Gerald C.; and May, Douglas C., to Eastman Kodak Company. Polyester film base having uniform high optical density. 3,790,653, Cl. 264-171.000.

Barnhart, Carlton L. Apparatus for dispensing flat articles. 3,790,027, Cl. 221-274.000.

Baron, Heinz. Multilaminar sheet structure. 3,790,433, Cl. 161-113.000.

Barrera, Roberto Gonzalez: *See—*
Rubio, Manuel Jesus; and Leal, Victor Mario, 3,789,660.

Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Moust, Daniel A., to Marsan Manufacturing Co., Inc. Fastening apparatus for ostomy appliances. 3,789,846, Cl. 128-283.000.

Barron, Mark B.; and Butler, Walter J., to General Electric Company. Gate-diffusion isolation for JFET depletion-mode bucket brigade circuit. 3,790,825, Cl. 307-304.000.

Bartoo, Charles O.: *See—*
Spengler, Duane E.; and Bartoo, Charles O., 3,789,538.

Barwell, Ian John, to Raleigh Industries, Limited. Method of and apparatus for truing spoked wheel. 3,789,475, Cl. 29-159.200.

BASF Wyandotte Corporation: *See—*
Vogt, Herwart C.; and Davis, Pauls, 3,790,625.

Bates, Robert W.: *See-*
Garrison, Mary M.; and Bates, Robert W., 3,790,663.

Baudin, Pol: *See—*
Van Laethem, Robert; Baudin, Pol; and Hoyois, Jean-Claude, 3,790,748.

Bauer, Fritz F. Energy storing device, particularly a blockable pneumatic spring. 3,790,119, Cl. 248-400.000.

Baum, Charles L., to Machlett Laboratories, Incorporated, The. X-ray tube target. 3,790,838, Cl. 313-60.000.

Baychem Corporation, mesne: *See—*
Aichenegg, Paul C.; and Emerson, Carl D., 3,790,683.

Bayer Aktiengesellschaft: *See—*
Boshagen, Horst; and Plempel, Manfred, 3,790,587.
Christoph, Geert; Radlmann, Eduard; and Nischk, Gunther, 3,790,531.
Diehr, Hans-Joachim, 3,790,509.
Lehnert, Gunther; Maertens, Dieter; and Witte, Josef, 3,790,543.
Maertens, Dieter; Lehnert, Gunther; and Pampus, Gottfried, 3,790,544.
Meiser, Werner; Metzger, Carl; Buchel, Karl Heinz; and Plempel, Manfred, 3,790,594.
Podschus, Ernst, 3,790,495.
Rosenbaum, Heinz Jorg; and Rudolph, Hans, 3,790,515.
Rosenbaum, Heinz Jorg; Rudolph, Hans; Dhein, Rolf; and Reinking, Klaus, 3,790,516.
Schon, Nikolaus, 3,790,538.
Schon, Nikolaus; Pampus, Gottfried; and Witte, Josef, 3,790,546.
Senning, Alexander; Buchholt, Hans Christian; Bierling, Robert; Steinhoff, Dieter; and Trossmann, Gerhard, 3,790,616.

Bayerische Motoren Werke A.G.: *See—*
Bortfeld, Manfred; and Winiershoff, Werner, 3,789,949.

Beam, William S., III. Pedal extenders for bicycle. 3,789,696, Cl. 74-594.100.

Becavin, Henri; and Ronsin, Michel, to Thomson-CSF. Radio beacon with a rotating cardioid radiation pattern in particular for use in landing grounds of secondary importance. 3,790,942, Cl. 343-106.00r.

Beck, Roderick; Harman, James F.; Shatila, Mounir A.; Richins, David A.; and Lack, John. Apparatus for reconstituting dry potato agglomerates into potato dough. 3,789,750, Cl. 99-536.000.

Becker, Harold D., to Cornell Aeronautical Laboratory, Inc. Communication apparatus having a ranging capability. 3,790,940, Cl. 343-12.00r.

Becker, James H.: *See—*
Wysocki, Joseph J.; Becker, James H.; and Dir, Gary A., 3,790,251.

Beckman Instruments, Inc.: *See—*
Way, Allan S.; and Hayman, William J., 3,790,283.

Beckwith Carbon Corporation: *See—*
Cowland, Frederick Claud; and Appleby, Harry, 3,790,393.

Becton, Dickinson & Company: *See—*
Antoshkiw, William T., 3,789,841.

B.E.L. - Tronics Limited: *See—*
Sagl, Rudolph J. C., 3,790,808.

Belknap, James R. Two speed wrench. 3,789,707, Cl. 81-57.390.

Bell Canada: *See—*
Montague, Bernard R.; Leyburn, Derek; Barker, John; Hannley, Ray John; Leblanc, Vincent G.; and Tam, Leslie K., 3,790,719.

Bell Canada-Northern Electric Research Limited: *See—*
Luff, Peter Purnell, 3,790,935.

Bell Telephone Laboratories, Incorporated: *See—*
Briley, Bruce Edwin, 3,790,823.
Corwin, Walter Leo, 3,790,893.
Cuthbert, John David; McMahon, Richard George; and Munro, David Farnham (said Cuthbert and said Munro assors. to), 3,790,287.
De Gregory, Donald Lee, 3,789,883.
Inose, Hiroshi; Masuko, Yutaka; and Saito, Tadao, 3,790,715.
Levinstein, Hyman Joseph, 3,790,405.
Miller, Stewart Edward, 3,790,902.
Moline, Robert Alan, 3,790,412.
Pohl, Karl-Heinz, 3,790,733.

Simms, Douglas Leon; Tolk, Norman Henry; and White, Clark Woody, 3,790,411.

Beller, Herbert R., to Allied Chemical Corporation. Energy absorbing retractor. 3,790,099, Cl. 242-107.400.

Bellina, Russell F., to Du Pont de Nemours, E. I., and Company. Carbamate esters of 2-oxyimino-3-keto-1,4-diheterocyclics. 3,790,566, Cl. 260-243.00r.

Bellmer, Thomas J., to Fedders Corporation. Tension ring for compressor vane. 3,790,148, Cl. 267-73.000.

Benasutti, Louis D.; and Sucro, Jost S., to General Motors Corporation. Ice door mechanism. 3,789,620, Cl. 62-344.000.

Bendix Corporation, The: *See*—
Burnett, Richard T., 3,789,737.
Fannin, Richard C., 3,790,222.
Fulmer, Keith H., 3,790,221.
Horner, Richard P., 3,789,738.
Korsch, Dietrich, 3,790,247.
Miller, Donald L., 3,789,966.
Normann, Richard W., 3,790,922.
Passeri, David P., 3,789,655.
Ritsema, Irving R., 3,790,224.
Rossigno, Louis P., 3,790,807.
Tam, George M.; Gardner, Delbert J.; Grabe, Frederick G.; Putt, James B.; Owens, Carl D.; and Sisco, William C., 3,789,735.
Taplin, Lael B.; Spitz, William R.; and Leung, Chun Keung, 3,789,816.

Benedetti, Lena: *See*—
Franz, Rudolph J.; Freismuth, John S.; and Benedetti, Nello L, 3,789,811.

Benedetti, Nello L: *See*—
Franz, Rudolph J.; Freismuth, John S.; and Benedetti, Nello L, 3,789,811.

Berend, David: *See*—
Rogers, Fred A.; and Berend, David, 3,790,810.

Berg, Donald P.; and Groth, Hugh P., to Cross River Products, Inc. Foldable and adjustable crib. 3,789,439, Cl. 5-99.00c.

Berg Manufacturing Company, The: *See*—
Brown, Curtis L., 3,790,229.

Bergegere, Pierre, to Coulter Electronics, Inc. Particle study apparatus having improved particle resolution means. 3,790,883, Cl. 324-71.0cp.

Berger, Abe, to General Electric Company. Organosilicon compound with isothiocyanate substituent bonded through divalent bridge. 3,790,613, Cl. 260-448.80r.

Berger, Rene. Articulated, unit cast case system for ungluing documents. 3,790,429, Cl. 156-584.000.

Bergey, John M., to Time Computer, Inc., mesne. Solid state watch with magnetic setting. 3,789,601, Cl. 58-50.00r.

Berglund, Richard N.; and Liu, Benjamin Y. H., to RNB Associates, Inc. Method and apparatus for generating monodisperse aerosol. 3,790,079, Cl. 239-3.000.

Berkelhammer, Gerald: *See*—
Asato, Goro; Berkelhammer, Gerald; and Gastrock, William Henry, 3,790,589.

Berlin, German Semenovich; Shenker, Dmitry Dmitrievich; and Sedebrenny, Valery Germanovich. Pickup of the angular speed of a rotating object. 3,789,673, Cl. 73-505.000.

Berman, Baruch, to TRW Inc. Energy storage and transfer power processor with self-contained parametric regulating loop. 3,790,816, Cl. 307-149.000.

Bernard, Christian, to Dollfus-Mieg & Cie. Prefabricated trouser Fly. 3,789,430, Cl. 2-234.000.

Bernstein, Barry E.; Erbstein, Robert S.; and Pazis, Thomas, to Leesona Corporation. Automatic control system for correcting textile machinery malfunctions from senses and stored malfunction data. 3,789,595, Cl. 57-34.00r.

Beroza, Morton: *See*—
Eddy, Gaines W.; Davis, Harry G.; Beroza, Morton; and McGovern, Terrence P., 3,790,666.

Berry, James M.; and Womack, William C., to Colspan Environmental Systems, Inc. Air/fuel mixing system controlled by temperature activated mechanism for internal combustion engines. 3,789,812, Cl. 123-117.00a.

Bert, Alain; Enjalbert, Roger; and Kern, Pierre, to Thomson-CSF. Electrostatic focussing devices especially for microwave tubes. 3,790,843, Cl. 315-5.340.

Besserdich, Orrin H.: *See*—
Crawford, Donald C.; and Besserdich, Orrin H., 3,790,157.

Best, Albert M.; and Alverson, Robert M., to Sperry Rand Corporation. Hay rolling machine with pickup means. 3,789,593, Cl. 56-341.000.

Bethlehem Steel Corporation: *See*—
Richley, Joseph L., 3,789,596.

Beverage-Air Sales Company: *See*—
Whorton, Robert B., III, 3,790,243.

Beyer, Ronald F.: *See*—
Lum, John C.; and Beyer, Ronald F., 3,790,610.

Bierling, Robert: *See*—
Senning, Alexander; Buchholt, Hans Christian; Bierling, Robert; Steinhoff, Dieter; and Trossmann, Gerhard, 3,790,616.

Biora, Julio L.: *See*—
Weisenberger, Lavern M.; and Biora, Julio L., 3,790,451.

Bird Electronic Corporation: *See*—
Lesyk, Leo; and Kaltenborn, David A., 3,790,904.

Birdsong, Fred: *See*—
Carson, Charles F.; Bryan, Carney J.; and Birdsong, Fred, 3,789,781.

Bishop, Stephen G.: *See*—
Mitchell, Dean L.; Bishop, Stephen G.; and Taylor, P. Craig, 3,790,250.

Bisque, Donny R.: *See*—
Koerner, Ernest C.; Wareham, William W.; and Bisque, Donny R., 3,790,530.

Bissell, Robert D., to Dresser Industries, Inc. Overload protected bourdon tube. 3,789,668, Cl. 73-418.000.

Bjelvert, Sven William. Receiver for a frequency-modulated electroacoustical signal having squelch means for suppressing noise when no signal is coming through the receiver. 3,790,891, Cl. 325-348.000.

Black, Robert; Provan, David; and Rainey, Christopher, to Burroughs Machines Limited. Security access medium. 3,790,754, Cl. 235-61.70b.

Blackburn, Dale W.; Devenney, Robert F.; and Jen, Timothy Yu-Wen, to Smithkline Corporation. Imidazo and pyrimido (2,1-b) quinazolines. 3,790,573, Cl. 260-256.40f.

Blair Manufacturing Co., Inc.: *See*—
Ryan, Kelly P., 3,790,035.

Blair, Rhio H., to Blalock, Edwin O. Fragrance-imparting laundering composition. 3,790,484, Cl. 252-89.000.

Blaker, Gene M.: *See*—
O'Neill, Richard J.; Blaker, Gene M.; Manthei, Edward C.; and Ronk, Elmer L., 3,790,951.

Blalock, Edwin O.: *See*—
Blair, Rhio H., 3,790,484.

Blanchard, Peter Michael: *See*—
Byford, Derek Clark; and Blanchard, Peter Michael, 3,790,481.
Rudston, Stanley George; Hyford, Derek Clark; and Blanchard, Peter Michael, 3,790,478.

Blatt, Leland F. Cam pin plunger clamp. 3,789,680, Cl. 74-102.000.

Bliss, Joseph Francis, to Union Carbide Corporation. Polyepoxide and amine hardner compositions. 3,790,522, Cl. 260-30.4ep.

Bloch, Herman S.; and Bouvar, James J., to Universal Oil Products Company. Organic coating process. 3,790,450, Cl. 204-14.00n.

Block, Herman S.: *See*—
Massie, Stephen N.; and Block, Herman S., 3,790,624.

Blount & George, Inc.: *See*—
Hogan, William M., 3,790,277.

Blue Bell, Inc.: *See*—
Carson, Charles F.; Bryan, Carney J.; and Birdsong, Fred, 3,789,781.

Bluestein, Claire; Rosenblatt, William; and Clark, John R., to Witco Chemical Corporation. Accelerated process for diaryl sulfone glycidyl ethers. 3,790,602, Cl. 260-348.600.

Blumberg, Harold, to Endo Laboratories, Inc., mesne. Certain indolobenzazepine derivatives as analgesics. 3,790,675, Cl. 424-20.300.

Blumer, John E.: *See*—
Lorenc, Allan L.; and Blumer, John E., 3,790,090.

Blumrich, Josef F., to United States of America, National Aeronautics and Space Administration. Omnidirectional wheel. 3,789,947, Cl. 180-79.300.

Blundell, Thomas: *See*—
Colchester, John Edward; and Blundell, Thomas, 3,790,585.

Boaz, Premakaran T.; and Surowiex, Roman, to Ford Motor Company. Heatable laminated windshield construction. 3,790,752, Cl. 219-522.000.

Bock, Gustav: *See*—
Graser, Fritz; and Bock, Gustav, 3,790,603.

Bock, John W., to McDonnell Douglas Corporation. Redundant stabilizer control. 3,790,108, Cl. 244-83.00d.

Boeing Company, The: *See*—
Gubala, Thomas J.; and Kraft, Wayne O., 3,790,706.

Boer, Karl W.: *See*—
United States of America, National Aeronautics and Space Administration, 3,790,795.

Boerio, Sergio: *See*—
Padovani, Piero; and Boerio, Sergio, 3,790,333.

Bogner, Richard S.: *See*—
United States of America, National Aeronautics and Space Administration, 3,790,409.

Bohanec, August. Adjustable carrying strap. 3,790,049, Cl. 224-45.00p.

Boley, William Franklin: *See*—
Hirata, Arthur Atsunobu; and Boley, William Franklin, 3,790,447.

Bolin, Larry R.; Hopper, Claude, Jr.; and Jolly, Shelby A., to General Electric Company. Microwave-excited light emitting device. 3,790,852, Cl. 315-267.000.

Bolleter, Hans Ulrich; and Schulthess, Hansruedi, to Salvis AG. Apparatus for steam pressure cooking of food. 3,790,391, Cl. 99-330.000.

Bomba, Zdenka. Shield for use in applying eyelash makeup. 3,789,856, Cl. 132-88.500.

Bondarenko, Oleg Petrovich: *See*—
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georievich, 3,790,691.

Bonde, Robert: *See*—
Stresau, Richard; and Bonde, Robert, 3,789,764.

Bondie, Dale J.; Sutton, Robert W.; and Lewelling, James L., to Ex-Cell-O Corporation. Machine tool with automatic tool changing means. 3,789,500, Cl. 29-568.000.

Bonfiglio, Charles P., to General Motors Corporation. Magnet mounting clip for a dynamoelectric machine. 3,790,830, Cl. 310-42.000.

Bor, Maria, nee Szabo: *See*—
Tuba, Zoltan; and Bor, Maria, nee Szabo, 3,790,574.

Borden, Gustav V.: *See*—
Luciano, Robert A.; Zmijewski, Chester M.; and Borden, Gustav V., 3,790,048.

Borman, August H., to General Motors Corporation. Liquid level control. 3,789,865, Cl. 137-122.000.

Bortfeld, Manfred; and Winiershoff, Werner, to Bayerische Motoren Werke A.G. Certain new and useful improvements in or relating to control means for the release of safety appliances in vehicles, more particularly passenger carrying automobiles. 3,789,949, I. 180-91.000.

Bosch, James D. B-B gun funnel device. 3,789,891, Cl. 141-331.000.

Bosch, Robert, G.m.b.H.: *See*—
Aldinger, Ulrich, 3,790,307.
Schmidt, Ulrich, 3,790,289.
Schnell, Gerhard, 3,790,001.

Bosch, Robert, Photokino GmbH: *See*—
Krumbein, Fritz, 3,789,685.

Bosch, Robert, Photokins GmbH: *See*—
Heinrich, Frank-Armin, 3,790,264.

Boshagen, Horst; and Plempel, Manfred, to Bayer Aktiengesellschaft. Antimycotic benzisothiazoline derivatives. 3,790,587, Cl. 260-304.000.

Boston, Denis R., to Olin Corporation. Adjustable scarfing tool. 3,789,734, Cl. 90-24.00b.

Bostrom, Bertil Ingemar; Ljungsahl, Soren Folkl Samuel; and Knoos, Stellan, to AGA Aktiebolag. Method of spirally winding strip to produce finned units. 3,789,494, Cl. 29-423.000.

Bottoms, Harry Simister. Pumps for liquids. 3,790,312, Cl. 417-424.000.

Bouvar, James J.: *See*—
Bloch, Herman S.; and Bouvar, James J., 3,790,450.

Bowen, William Edmund, to American Can Company. Method of forming a line of weakness in a multilayer laminate. 3,790,744, Cl. 219-121.0lm.

Bowerfind, Albert L.; and Avilzer, Zvi, to Daggeem, Inc. Fishing line threading means for telescopic rods. 3,789,533, Cl. 43-18.00r.

Bowser, Wenard, Jr.: *See*—
Pfaff, Henry C., Jr.; and Bowser, Wenard, Jr., 3,790,814.

Boyd, David C.; and Williams, Joseph M., to Corning Glass Works. High strength ophthalmic lens. 3,790,260, Cl. 351-159.000.

Boyd, James W., to Packaging Corporation of America. Carton construction. 3,790,062, Cl. 229-2.500.

Boyer, Jean-Jacques. Rotary device with adjustable axial bearing. 3,789,740, Cl. 91-486.000.

Boylan, Joseph W.; and Shenk, John W., to Armstrong Cork Company. Joint structure for suspended ceiling system member. 3,789,566, Cl. 52-573.000.

Bozek, John W. Fluid flow range indicating apparatus. 3,789,664, Cl. 73-209.000.

Bradbury, Douglas W.; and Huey, Cecil O., Jr., to Singer Company, The. Tracking mechanism for belt sanders. 3,789,552, Cl. 51-135.0bt.

Bradshaw, Geoffrey Lionel Guy. Electric switch assemblies with spring biased rotatable knob actuator for gear shift lever or the like. 3,790,729, Cl. 200-61.880.

Brancaleone, Salvatore T.; and Oliver, Leland W., to International Telephone and Telegraph Corporation. Electrical connector with component grounding plate. 3,790,858, Cl. 317-99.000.

Brand, Charles S., to Oberly & Newell, Inc. Modular display stand. 3,789,778, Cl. 108-94.000.

Brandenburg, Helmut, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Glue-applying apparatus for corrugated paperboard machine. 3,789,795, Cl. 118-262.000.

Branson Instruments Incorporated: *See*—
Jacke, Stanley E.; and Jugler, John, 3,790,059.

Braun, Martin. Cooling means for electrodes. 3,790,836, Cl. 313-13.000.

Brede, Alexander, III; Talmage, Charles Robert; and Tuttle, Elvin E. Method and apparatus for sintering annular compacts. 3,790,336, Cl. 432-163.000.

Bredsted, Ole Jakobsen: *See*—
Pedersen, Henry Valdemar; and Bredsted, Ole Jakobsen, 3,790,301.

Breitfuss, Thomas K., to Hydro Conduit Corporation. Lined conduit. 3,789,886, Cl. 138-146.000.

Brejaud, Hubert P., to Office National d'Etudes et de Recherches Aerospatiales. System for measuring time differences between remote clocks and for synchronizing the same. 3,789,653, Cl. 73-6.000.

Brems, John Henry. Reciprocating drive mechanism. 3,789,676, Cl. 74-27.000.

Bremshey AG: *See*—
Fuelling, Wolfgang; and Osenberger, Werner, 3,790,234.

Brendel, Albert E.: *See*—
Cooper, Phillip V.; and Brendel, Albert E., 3,790,811.

Bresson, Raymond: *See*—
Charamel, Pierre; and Bresson, Raymond, 3,790,725.

Breveteam SA: *See*—
Colijn, Johannes Jacobus Vincent; and Tesch, Gunter Horst, 3,790,652.

Brewer, Andrew I., to Star-Kist Foods, Inc. Cat litter. 3,789,797, Cl. 119-1.000.

Bridge, Samuel Douglas: *See*—
Robbins, John Lyndon; and Bridge, Samuel Douglas, 3,789,554.

Bridgestone Tire Company, Limited: *See*—
Onishi, Akira; Irako, Koichi; Hayakawa, Yoshihiro; Shimomura, Takeshi; Kawagoi, Takahiro; and Miyamoto, Shoji, 3,790,539.

Briley, Bruce Edwin, to Bell Telephone Laboratories, Incorporated. High-speed transistor digital gating. 3,790,823, Cl. 307-255.000.

Brindell, Gordon D.; and Macander, Rudy F., to Quaker Oats Company, The. Polyolefin stabilized with 3,5-disubstituted-4-hydroxybenzyl alcohol or amine. 3,790,526, Cl. 260-45.85s.

Brinks, Floyd J.: *See*—
McNally, George S.; Brinks, Floyd J.; and Lee, Sang H., 3,789,773.

British Oxygen Company Limited, The: *See*—
Davidge, Harold, 3,789,616.
Lister, Paul Frank, 3,790,788.

British Petroleum Company Limited, The: *See*—
Byford, Derek Clark; and Blanchard, Peter Michael, 3,790,481.
Rudston, Stanley George; Hyford, Derek Clark; and Blanchard, Peter Michael, 3,790,478.

Brock, Alan J., to Repco Research Pty., Ltd. Electrostatic copier. 3,790,375, Cl. 96-1.00r.

Brock-White Co.: *See*—
Sels, Wally O.; and Paul, Alfred L., 3,790,121.

Brodbeck, Helmut, to Efka-Werke Fritz Kiehn GmbH. Apparatus for packaging tubular articles. 3,790,025, Cl. 221-200.000.

Brokaw, Adrina Paul, to Keithley Instruments, Inc. Switching regulator having improved control circuitry utilizing direct sensing of energy applied to and released from a storage inductor. 3,790,878, Cl. 323-17.000.

Broling, Keith W.; and Tatina, Richard A., to Portec, Inc. Adjustable pedestal assembly. 3,789,775, Cl. 105-367.000.

Brooks, Charles: *See*—
Palfi, Thomas L.; Brooks, Charles; and Miller, George J., 3,790,961.

Brooks, Jul W.; Waters, Delman C.; and Ciener, Paul J. Inventory control apparatus. 3,789,530, Cl. 46-124.000.

Bross, Charles Frederick, to Pennwalt Corporation. Article packaging machine. 3,789,575, Cl. 53-160.000.

Brossi, Arnold; Focella, Antonino; and Teitel, Sidney, to Hoffmann-La Roche Inc. Process for the preparation of alkyl substituted resorcinols. 3,790,636, Cl. 260-586.00r.

Brouwer, Gerardus Johannes, to Brouwer Turf Equipment Limited. Device for starting a turn in the end of a sod strip. 3,790,096, Cl. 242-55.000.

Brouwer Turf Equipment Limited: *See*—
Brouwer, Gerardus Johannes, 3,790,096.

Brown & Rost, Inc.: *See*—
Hauber, Ferdinand R., 3,790,009.

Brown, Barry M.; and Ray, Elbert L., to Eastman Kodak Company. Cellulosic reverse osmosis membranes having high flux and high salt rejection. 3,789,993, Cl. 210-500.000.

Brown, Boveri & Cie Limited: *See*—
Sidler, Erwin, 3,790,299.

Brown, Boveri & Company, Limited: *See*—
Floessel, Dieter; and Mauthe, Gerhard, 3,790,695.

Brown, Cicero C. Anchoring assembly for anchoring well equipment within a tubular well conduit. 3,789,925, Cl. 166-125.000.

Brown, Curtis L., to Berg Manufacturing Company, The. Emergency application brake valve assembly and system. 3,790,229, Cl. 303-52.000.

Brown, Kenneth J. Hog skinning II. 3,789,458, Cl. 17-21.000.

Brown, Kenneth Robson, to Ferranti Limited. Inertial navigation systems. 3,790,766, Cl. 235-150.250.

Brown, Merle S.: *See*—
Gardner, John A., Jr.; and Brown, Merle S., 3,790,028.

Brown Oil Tools, Inc.: *See*—
Garrett, Henry U., 3,789,923.

Brown, Richard L. Apparatus for simulating crossroads vehicular traffic. 3,790,169, Cl. 273-86.00r.

Brown, Roland Clough. Security steer-gear cyclelock. 3,789,634, Cl. 70-186.000.

Brown, William Ray, to Mallory, P. R., and Co., Inc. Cam operated electrical time assembly with improved contact and associated peripheral rib cam. 3,790,726, Cl. 200-38.00b.

Broz, Jerry J., to Twinn-K, Inc., mesne. Slot car track cleaning device. 3,789,768, Cl. 104-279.000.

Bruckner, Ronald L., to National Cash Register Company, The. Supply voltage and clock signal monitor. 3,790,818, Cl. 307-235.00r.

Bruen, Charles Patrick; Wamser, Christian Albert; and Morgan, Thomas Richard, to Allied Chemical Corporation. Method of extracting and recovering chromium values from chromite ore. 3,790,456, Cl. 204-61.000.

Brugnoli, Angelo, to Amici, Francesco and Brugnoli, Maria. Siphon with pneumatic priming and suction. 3,789,433, Cl. 4-44.000.

Brugnoli, Maria: *See*—
Brugnoli, Angelo, 3,789,433.

Brunet, Louis C. C.; and Corroyer, Pierre R. P. Piezo-electric control device for clock work and the like timing systems. 3,790,827, Cl. 310-9.100.

Brunetti, Heimo: *See*—

Schmidt, Andreas; Brunetti, Heimo; and Schwarzenbach, Kurt, 3,790,648.

Brunskill, Robert Thompson; and Langmead, Walter Alfred, to United Kingdom Atomic Energy Authority. Radiation dosemeters of the thermoluminescent type. 3,790,783, Cl. 250-362.000.

Brunswick Corporation: *See*—
Fick, Bernard E.; and Yamasaki, Kim, 3,789,821.

Brunton, Donald C.; and Soltesz, Carl R., to Infra Systems, Inc. Method and apparatus for measurement of sheet opacity. 3,790,796, Cl. 250-339.000.

Brusakov, Jury Ivanovich; Sirotkin, Nikolai Nikolaevich; Kiselev, Vasily Pavlovich; Ilinkov, Dmitry Vladimirovich; Pavlovichavdely, Mikhail; Marin, Semen Panteleevich; Shkarupa, Alexandr Ivanovich; Veisman, Boris Ottovich; Lebedev, Vladimir Nikolaevich; an Gavrilenko, Nikolai Pavlovich. Three-phase electric furnace for manufacturing aluminium-silicon alloys. 3,790,692, Cl. 13-9.000.

Bryan, Carney J.: *See*—
Carson, Charles F.; Bryan, Carney J.; and Birdsong, Fred, 3,789,781.

Bryk, Petri B.; Honkasalo, Jorma B.; Malmstron, Rolf E.; Makipirtti, Simo A. I.; Toivanen, Toivo A.; and Aaltonen, Olavi A., to Outokumpu ly. Method of flash smelting sulphide ores. 3,790,366, Cl. 75-23.000.

Buchel, Karl Heinz: *See*—
Meiser, Werner; Metzger, Carl; Buchel, Karl Heinz; and Plempel, Manfred, 3,790,594.

Buchholt, Hans Christian: *See*—
Senning, Alexander; Buchholt, Hans Christian; Bierling, Robert; Steinhoff, Dieter; and Trossmann, Gerhard, 3,790,616.

Buckingham, Robert P., to Okonite Company, The. Power cable shielding. 3,790,697, Cl. 174-102.000.

Buczek, Carl J.; Skolnick, Michael L.; and Gurski, Gary F., to United Aircraft Corporation. Peaked power coherent pulsed laser transmitter/receiver. 3,790,278, Cl. 356-28.000.

Bugg, Francis V.: *See*—
Bugg, Vernon M., Sr.; and Bugg, Francis V., 3,790,708.

Bugg, Kenly C., to Kendick Manufacturing Co. Electro-mechanical display device. 3,789,525, Cl. 40-28.00c.

Bugg, Vernon M., Sr.; and Bugg, Francis V., to Telectrotype Corporation of America. Communication method and apparatus. 3,790,708, Cl. 178-17.00c.

Bullard, Haran W. Hopper door operating and locking mechanism. 3,789,772, Cl. 105-240.000.

Bulteau, Gerard C., to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France. Methods of treating cholesterolemia. 3,790,681, Cl. 424-311.000.

Bum, Nicolaas, to Medische Faculteit Rotterdam. Heart examination by means of ultrasound waves. 3,789,833, Cl. 128-2.00v.

Bunger, David A., to Baldwin, D. H., Company. Voltage controlled chord organ. 3,789,718, Cl. 84-1.010.

Bunger, Richard E. Portable self-aligning wall forming apparatus. 3,790,321, Cl. 425-63.000.

Bunker Ramo Corporation: *See*—
Anderson, Norman Richard, 3,790,791.
Mathe, Istvan, 3,790,923.

Burford, Charles E. Bale tying device. 3,789,751, Cl. 100-19.00r.

Burges, Albert. Foil sealed syringe. 3,789,844, Cl. 128-235.000.

Burlington Industries, Inc.: *See*—
Laxson, J. T., 3,790,047.

Burnett, Richard T., to Bendix Corporation, The. Self-purging brake actuator. 3,789,737, Cl. 91-41.600.

Burns, Richard W., to Hughes Aircraft Company. High power diode phase shifter. 3,790,908, Cl. 333-31.00a.

Burroughs Corporation: *See*—
Dedek, Frank G., 3,790,374.
Doane, John C.; Holz, George E.; Ogle, James A.; and Samlyody, Arpod, 3,790,850.
Eldert, Cornelius, 3,790,959.

Burroughs Machines Limited: *See*—
Black, Robert; Provan, David; and Rainey, Christopher, 3,790,754.

Burrous, Merwyn L., to Chevron Research Company. Erosion-inhibited functional fluids. 3,790,487, Cl. 252-78.000.

Burton, Robert V., to Honeywell Inc. Synchronized steering control system. 3,789,940, Cl. 180-6.480.

Busch, Norbert: *See*—
Mauvernay, Roland-Yves; Busch, Norbert; Simond, Jacques; and Moleyre, Jacques, 3,790,569.

Busheev, Anatoly Ivanovich: *See*—
Manyafov, Valery Nikolaevich; Busheev, Anatoly Ivanovich; Semenov, Roman Lvovich; and Klevtsov, Valery Alexeevich, 3,790,000.

Busler, William R.: *See*—
Nielsen, Ralph R.; and Busler, William R., 3,790,477.

Bussart, Clayton J.; and Puli, Albert A., to Mine Safety Appliances Company. Apparatus for determining the carbon monoxide, methane and total hydrocarbons content in air. 3,790,348, Cl. 23-254.0ef.

Butler, Kenneth, to Pfizer Inc. Aryl esters of phenyl ketene carboxylic acids. 3,790,620, Cl. 260-471.00r.

Butler, Walter J.: *See*—
Barron, Mark B.; and Butler, Walter J., 3,790,825.

Butts, Mervin R.; and Robbins, Joseph J., to General Motors Corporation. Four vane elliptical rotary air conditioning compressor. 3,790,311, Cl. 417-410.000.

Byford, Derek Clark; and Blanchard, Peter Michael, to British Petroleum Company Limited, The. Synthetic lubricants for aero gas turbines. 3,790,481, Cl. 252-49.900.

Bylund, Don M., to Deering Milliken Research Corporation. Yarn separator. 3,790,426, Cl. 156-435.000.

Cagen, George, to Ideal Toy Corporation. Doll tearing mechanism. 3,789,539, Cl. 46-135.00a.

Cahn, Jean: *See*—
Wermuth, Camille Georges; and Cahn, Jean, 3,790,563.

Caldwell, Robert J., to Mohasco Industries, Inc. Footrest mechanism. 3,790,211, Cl. 297-75.000.

Callais, Richard T.; Eisenberg, Herbert; Forbes, F. Douglas; Kosco, Thomas J.; Taxin, Harry M.; and Frost, John B., to Hughes Aircraft Company. CATV program control system. 3,790,700, Cl. 178-5.100.

Callaway, James W. Coin operated dart game. 3,790,173, Cl. 273-102.20r.

Callins, Harold I.; and Doster, William H., to Whitehall Electronics Corporation. Fused cathode electrolytic capacitors and method of making the same. 3,789,502, Cl. 29-570.000.

Cameron, Robert W., to Timken Company, The. Bearing seal. 3,790,178, Cl. 277-95.000.

Camosso, Domenico, to Riv-Skf Officine Di Villar Perosa S.p.A. Homokinetic joints. 3,789,624, Cl. 64-21.000.

Campbell, Curtis M.; McConnell, Walter J.; and Skutecki, Edmund R., to Sperry Rand Corporation. Method and means for increasing the resolution of analog-to-digital converter systems. 3,790,947, Cl. 340-347.0ad.

Campbell, Francis Joseph, to RCA Corporation. Focus-grill cathode-ray tube image reproducer modulation with grill voltage. 3,790,845, Cl. 315-31.00r.

Campbell, John B.; Cluff, Edward Fuller; and Sarafidis, Christos, to Du Pont de Nemours, E. I., and Company. Mineral oil composition. 3,790,480, Cl. 252-59.000.

Campisano, Fred M. Window arrangement. 3,789,548, Cl. 49-162.000.

Canon Kabushiki Kaisha: *See*—
Knechiel, Wilhelm; Petersdorf, Gerhard; and Sandner, Winfried, 3,790,272.
Ogiso, Mitsutoshi; Shikawa, Kazuo; and Shigeta, Yoshihiro, 3,790,265.

Canter, Richard S. Lock with security counter. 3,789,639, Cl. 70-437.000.

Capdebosco, Andre: *See*—
DeChassy, Christian; and Capdebosco, Andre, 3,789,921.

Carding Specialists Co., Limited: *See*—
Whittaker, Harold, 3,790,728.

Carley, Adam Loran. Method and apparatus for thermal viscosity modulating a fluid stream. 3,790,703, Cl. 178-6.60r.

Carlson, Arthur, Jr.: *See*—
Glass, Max E.; Donahue, Stephen F.; and Carlson, Arthur, Jr., 3,790,665.

Carlson, John A.; Hoff, Dale R.; and Rooney, Clarence S. 1-Substituted-5-nitroimidazol-2-ylalkyl-(N-substituted)-carbamates. 3,790,592, Cl. 260-309.000.

Carlson, John A.; Hoff, Dale R.; and Rooney, Clarence S. 1-Substituted-5-nitroimidazol-2-ylalkyl-(N-substituted)-carbamates. 3,790,593, Cl. 260-309.000.

Carlstedt, Paul A.: *See*—
Tall, Leonard H.; Carlstedt, Paul A.; and Erickson, Arlen J., 3,789,571.

Carlton, Gordon: *See*—
Stirling, James Alexander; and Carlton, Gordon, 3,790,010.

Carney, James E.: *See*—
De Vita, Raymond A.; Romeo, Vincent P.; and Carney, James E., 3,789,483.

Carpenter, John L., to Container Corporation of America. Cushioned folder. 3,790,065, Cl. 229-40.000.

Carr, Norman L.; and Stahlfeld, Donald L., to Gulf Research & Development Company. Process for initial removal of sulfur compounds from gaseous hydrocarbon feedstocks before removal of arsenic therefrom. 3,789,581, Cl. 55-73.000.

Carrier Corporation: *See*—
Italiano, Frank; Tobin, Curtis L.; Martin, William C., Jr.; and Honnold, Fred V., Jr., 3,790,114.
Kincaid, James F.; and MacLeod, David E., 3,789,619.
Rifkin, Ernest; and Dreibelbis, Richard C., 3,790,075.

Carrotte, Frederick Henry; and Ellis, John Ernest, to Kirkland, A., & Company Limited. Pattern device for knitting machines. 3,789,629, Cl. 66-50.00r.

Carson, Charles F.; Bryan, Carney J.; and Birdsong, Fred, to Blue Bell, Inc. Sewing system. 3,789,781, Cl. 112-121.290.

Carson, Don B., to Universal Oil Products Company. Flow distribution apparatus. 3,789,989, Cl. 210-284.000.

Carson, Loren A.; Tremewan, R. S.; and Yanke, Ronald C. Delimberdebarker. 3,789,893, Cl. 144-208.00e.

Carter, Charles M.: *See*—
Schreiner, Louis W., 3,789,815.

Carter, James R.: *See*—
Snodgrass, Robert H.; Carter, James R.; and Edstrom, Carl M., 3,789,497.

Casby, Thomas D.; and Chapman, George M., to Catalysts and Chemicals, Inc. Low temperature methanol synthesis catalyst. 3,790,505, Cl. 252-463.000.

Case Western Reserve University: *See*—
Pao, Yoh-Han, 3,790,252.

Casio Computer Co., Ltd.: *See—*
Sugiya, Yuji, 3,790,953.
Castro Convertible Corporation: *See—*
Barabas, Andrew, 3,789,496.
Catalysts and Chemicals, Inc.: *See—*
Casby, Thomas D.; and Chapman, George M., 3,790,505.
Caterpillar Tractor Company: *See—*
Jorgensen, Stanley A.; and Adams, Stanley B., 3,789,946.
Catherin, Jean-Michel: *See—*
Dessus, Benjamin; Migne, Jacques; and Catherin, Jean-Michel, 3,790,899.
C.A.V. Limited: *See—*
Asbery, John Harrison; and Fenne, Ivor, 3,789,818.
Caverly, Brian Leonard; Meertens, Gerard Joseph Hendrik; and Rossell, John Barry, to Lever Brothers Company. Process for preparing edible fats by hydrogenation and fractionation of triglyceride fatty oils containing C_{20} and C_{22} fatty acids. 3,790,608, Cl. 260-409.000.
Centronics Data Computer Corporation: *See—*
Howard, Robert; and Robinson, Prentice I., 3,789,969.
Ceskoslovenska Akademie ved: *See—*
Novak, Jiri, 3,790,449.
Cessna Aircraft Company, The: *See—*
Krehbiel, Robert D.; and Graber, Homer R., 3,789,739.
Pauls, Charles W., 3,790,129.
Chambers, Ondas S. Dental floss holder. 3,789,859, Cl. 132-92.00r.
Champan, Paul Leonard, to RCA Corporation. Electronic time measurement. 3,789,600, Cl. 58-39.500.
Champeau, Andre, to Creusot-Loire. Apparatus for producing a flow in a liquid mixture. 3,790,141, Cl. 261-77.000.
Champion Spark Plug Company: *See—*
Westenkirshner, Frank A.; and Rempes, Paul E., Jr., 3,790,842.
Chamran, Morteza, to Perkin-Elmer Corporation, The. Log amplifier apparatus. 3,790,819, Cl. 307-229.000.
Chance, A. B., Company: *See—*
Engert, Fred O., 3,790,698.
Chandler Evans Inc.: *See—*
Morrison, Terry, 3,790,765.
Chao, Gene, to United States of America, Navy. Electroacoustic surface acoustic wave beam deflector. 3,790,828, Cl. 310-9.700.
Chapman, George M.: *See—*
Casby, Thomas D.; and Chapman, George M., 3,790,505.
Charamel, Pierre; and Bresson, Raymond, to Merlingerin Societe Anonyme. Linearly extending electrical distribution system having extruded shape conductor rails. 3,790,725, Cl. 191-29.000.
Chase, Myron C., to Weatherby/Nasco, Inc. Simulated human limb. 3,789,518, Cl. 35-17.000.
Chaturvedi, Mahesh C. Co-Ni-Cr base austentic alloys precipitation strengthened by intermetallic compounds and carbides. 3,790,372, Cl. 75-134.00f.
Cheetham, Ian; Dunkerley, Kenneth; Greenhalgh, Colin William; and Phillips, Duncan Adrian Sidney, to Imperial Chemical Industries Limited. Anthraquinone compounds. 3,790,604, Cl. 260-383.000.
Chem Valley Machine, Inc.: *See—*
Armstrong, Dan F.; and Armstrong, George F., 3,789,880.
Chemarin, Maurice Roger Francois. Manufacturing process for dolls, puppets, plush animals, consisting in the use of two fabrics adherent on to the other. 3,789,547, Cl. 46-158.000.
Chemical Construction Corporation: *See—*
Shah, Indravadan S.; and Rinckhoff, John B., 3,789,902.
Chevalier, Gabriel: *See—*
Rouxel, Roland; and Chevalier, Gabriel, 3,790,764.
Chevalier, Paul; Menard, Claude; and Dorval, Bertrand, to Prayfel Inc. Random number generator. 3,790,768, Cl. 235-152.000.
Chevron Research Company: *See—*
Anderson, Donald J., 3,790,643.
Burrous, Merwyn L., 3,790,487.
Pasky, Joseph Z., 3,790,609.
White, Robert J., 3,790,472.
Chicago Rawhide Manufacturing Company: *See—*
Heyn, William O.; and Peisker, Glenn W., 3,790,180.
Ching, Larry K. W., Jr.; and Shafter, Carl E., to United States of America, Army. Grid for strain measurements. 3,789,657, Cl. 73-88.00r.
Chivers, Malcolm; Dawson, William Grant; Masterman, Paul Henry; and Weston, Martin Andrew, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for State for Defense in Her Britannic Majesty's Government of the. Antenna tracking systms. 3,790,941, Cl. 343-100.0pe.
Christianson, Lee H. Cattle guard. 3,790,135, Cl. 256-17.000.
Christoph, Geert; Radlmann, Eduard; and Nischk, Gunther, to Bayer Aktiengesellschaft. High molecular weight linear copolyamides containing oxamide groups. 3,790,531, Cl. 260-78.00r.
Chwastyk, Adolph M., to United States of America, Navy. Underwater sound signal discriminating system. 3,790,927, Cl. 340-5.00r.
Ciaffone, John T., to Warner-Lambert Company. Hot cream dispenser. 3,790,033, Cl. 222-146.0ha.
Ciba-Geigy Corporation: *See—*
Bader, Jorg; and Gatzi, Karl, 3,790,677.
Dexter, Martin; Knell, Martin; and Peterli, Hans Jakob, 3,790,597.
di Giovanoel, Gaudenz Girell; and Zweidler, Reinhard, 3,790,491.
Gallay, Jean-Jacques, 3,790,601.
Schmidt, Andreas; Brunetti, Heimo; and Schwarzenbach, Kurt, 3,790,648.
Traber, Walter; Hambock, Heinz; and Weiss, Anton George, 3,790,615.
Ciener, Paul J.: *See—*
Brooks, Jul W.; Waters, Delman C.; and Ciener, Paul J., 3,789,530.
Cirulli, Albert: *See—*
Wasserman, Seymour; Cirulli, Albert; and Farrar, Edward A., 3,789,747.
Cities Service Oil Company: *See—*
Rosenwald, Gary W., 3,789,670.
Civilforsvarsstyrelsen: *See—*
Lund, Bodil Vibeke Jerslev; and Lund, Frederik Christian Freuchen Oxenboll, 3,789,839.
Clark Equipment Company: *See—*
Jones, Cecil E., 3,790,133.
Clark, John R.: *See—*
Bluestein, Claire; Rosenblatt, William; and Clark, John R., 3,790,602.
Clark, Pauline Cecilia: *See—*
Clark, Robert Clement; Clark, Pauline Cecilia; and Clark, Robert Bevan, 3,789,903.
Clark, Robert Bevan: *See—*
Clark, Robert Clement; Clark, Pauline Cecilia; and Clark, Robert Bevan, 3,789,903.
Clark, Robert Clement; Clark, Pauline Cecilia; and Clark, Robert Bevan. Highly compact stable awning for travel trailers, motor homes and/or campers. 3,789,903, Cl. 160-75.000.
Clayton Manufacturing Company: *See—*
Olsen, Dick Merlin, 3,789,658.
Cleary, James M. Hydrofoil sailing craft. 3,789,789, Cl. 114-60.50h.
Clements, Michael R.: *See—*
Amdahl, Gene M.; Clements, Michael R.; and Topham, Lyle C., 3,790,960.
Clements, Philip A.: *See—*
United States of America, National Aeronautics and Space Administration, 3,790,906.
Cleveland Machine Controls, Inc.: *See—*
Klimo, Robert G., 3,790,874.
Close, James Garth. Check out system. 3,789,957, Cl. 186-1.0ac.
Clowes, Ernest J., to Aluminum Company of America. Draw ring for cans. 3,789,649, Cl. 72-350.000.
Cluff, Edward Fuller: *See—*
Campbell, John B.; Cluff, Edward Fuller; and Sarafidis, Christos, 3,790,480.
Cohen, Sidney M., to Fuller Company. Manufacture of lightweight aggregate. 3,790,334, Cl. 432-58.000.
Cohn, Reuben J.: *See—*
Roberts, Marvin E.; Cohn, Reuben J.; and Ward, James E., 3,789,638.
Colchester, John Edward; and Blundell, Thomas, to Imperial Chemical Industries, Limited. Manufacture of bipyridylium salts. 3,790,585, Cl. 260-295.0am.
Cole, Frederic W., to AMBAC Industries, Incorporated. Method of diffusion bonding. 3,789,498, Cl. 29-470.900.
Cole, John Wayne: *See—*
Flouret, George Rogelio; and Cole, John Wayne, 3,790,555.
Coleman, George E., to PPG Industries, Inc. Apparatus for ultraviolet light treatment in a controlled atmosphere. 3,790,801, Cl. 250-453.000.
Coleman, Richard L.: *See—*
Mead, Theodore C.; Cummins, Billy H.; and Coleman, Richard L., 3,790,470.
Colijn, Johannes Jacobus Vincent; and Tesch, Gunter Horst, to Breveteam SA. Method for producing a thermoplastic net by slitting and shrinkage operations. 3,790,652, Cl. 264-146.000.
Collanus, Heikki, to Dy Tampella Ab. Coupling releasable under tension. 3,789,464, Cl. 24-68.0ct.
Coller, James Ray, to AMP Incorporated. Mechanical analogue computer and wiring machine. 3,789,481, Cl. 29-203.00p.
Collier, Everett J.: *See—*
Jones, Jack D.; and Collier, Everett J., 3,790,482.
Colloids, Inc.: *See—*
Lum, John C.; and Beyer, Ronald F., 3,790,610.
Collomosse, Herbert; and Bacon, Patrick Albert Henry, to Newmark, Louis, Limited. Pattern control system for controlling textile machinery. 3,790,704, Cl. 178-6.800.
Colspan Environmental Systems, Inc.: *See—*
Berry, James M.; and Womack, William C., 3,789,812.
Columbia Gas System Service Corporation: *See—*
Debaets, Michael P., 3,790,952.
Groom, Jack J.; and Kinzel, Gary L., 3,789,511.
Combes, Robert P., to Societe pour le Developpement de la Recherche Applique. Pressurized fluid valves. 3,789,866, Cl. 137-219.000.
Commercial Solvents Corporation: *See—*
Griffith, George L., 3,789,760.
Commissariat a l'Energie Atomique: *See—*
Geller, Richard, 3,790,787.
Germond, Jean-Claude; Glachet, Charles; and Guilbaud, Jean-Pierre, 3,790,002.
Prquignot, Michel, 3,789,499.
Communications Satellite Corporation: *See—*
Free, Bernard A., 3,789,608.
Compagnie des Ateliers et Forges de la Loire: Saint Chamond; Firminy; Saint Etienne; Jacob Holtzer; C.A.E.L.: *See—*
Ruget, Gabriel, 3,789,908.
Compagnie Generale d'Electricite: *See—*
Dessus, Benjamin; Migne, Jacques; and Catherin, Jean-Michel, 3,790,899.

Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie: *See—*
Verdier, Henri, 3,789,900.

Computer Devices Corporation: *See—*
Morreale, Anthony P., 3,790,831.

Computer Medical Science Corporation: *See—*
Andries, Francis M., 3,790,712.

Coniagas Research, Inc.: *See—*
Sharpe, Edgar John, 3,790,882.

Conley, John L. Automatic poultry egg collector. 3,789,802, Cl. 119-48.000.

Conn, Jack Samuel; and Fabien, Lionel Ralph, to Surrey Steel Components, Limited. Device for clearing blocked pipes. 3,789,861, Cl. 134-166.00c.

Connell, John G. Self-cleaning air flow bar for apparatus for making aggregate. 3,790,337, Cl. 432-239.000.

Constant, James Nickolas. Real time synthetic radar. 3,790,939, Cl. 343-10.000.

Container Corporation of America: *See—*
Carpenter, John L., 3,790,065.
Murray, Lowell C.; and Hose, John M., 3,790,019.

Control Data Corporation: *See—*
Mayer, William N.; Strom, Richard A.; and Ulstad, Meredith S., 3,790,849.

Controls Company of America: *See—*
Ditzig, Albert F., 3,789,701.

Converse, Gordon L.; and Mihulka, Merle C., to Twin Bay Industries, Inc. Template for use in the routing of workpieces. 3,789,892, Cl. 144-144.500.

Convertine, Frank J.; and Ganance, Charles G., to General Mills Fun Group, Inc. Compressed air propelled toy vehicle and launching system. 3,789,540, Cl. 46-202.000.

Conway, Robert W. Apparatus for aerating water. 3,790,140, Cl. 261-62.000.

Conwed Corporation: *See—*
Larsen, Ronald L., 3,790,326.

Cook, Albert N.; Goetz, Lawrence R.; Manley, Paul A.; and Yelpo, Joseph P. Sewing machine and motor speed regulating system therefor. 3,789,783, Cl. 112-220.000.

Cook, George W.; and Milne, David T., to United States of America, Navy. Direct measurement of ship body distortion using a laser beam. 3,790,276, Cl. 356-5.000.

Cook, Thomas A.: *See—*
United States of America, National Aeronautics and Space Administration, 3,790,037.

Cooke-Yarborough, Bustace. Screwdrivers and like tools. 3,789,896, Cl. 145-54.000.

Cooper, Jerry W.: *See—*
Haley, John S.; Cooper, Jerry W.; and Logan, Arthur D., 3,790,437.

Cooper, Phillip V.; and Brendel, Albert E., to Lebow Associates, Inc. Ground reference network. 3,790,811, Cl. 307-94.000.

Copolymer Rubber & Chemical Corporation: *See—*
Wahborg, Harold J., 3,790,519.

Cornell Aeronautical Laboratory, Inc.: *See—*
Becker, Harold D., 3,790,940.
Stiller, Paul F., 3,790,760.

Corning Glass Works: *See—*
Bagley, Rodney D., 3,790,654.
Boyd, David C.; and Williams, Joseph M., 3,790,260.
Eaton, David L., 3,790,475.
Mochel, Ellen L., 3,790,430.

Corroyer, Pierre R. P.: *See—*
Brunet, Louis C. C.; and Corroyer, Pierre R. P., 3,790,827.

Cort, Arthur H. Vehicle security system. 3,790,933, Cl. 340-63.000.

Corwin, Walter Leo, to Bell Telephone Laboratories, Incorporated. Sample and hold circuit for digital signals. 3,790,893, Cl. 328-151.000.

Costa, Georges, to Paillard S.A. Striking device for a typewriter. 3,789,970, Cl. 197-17.000.

Cotreau, Alex P.; and Jacobs, John F., to USM Corporation. Positive drive roller planetary wave generator. 3,789,700, Cl. 74-801.000.

Coulter Electronics, Inc.: *See—*
Bergegere, Pierre, 3,790,883.

Cowan, Larry C.; and Rubel, Edward A., to Leesona Corporation. Fluid operated system. 3,789,864, Cl. 137-119.000.

Cowen, John F. Honeycomb decapping and honey extracting apparatus. 3,789,443, Cl. 6-12.00a.

Cowland, Frederick Claud; and Appleby, Harry, to Beckwith Carbon Corporation. Carbonaceous bodies. 3,790,393, Cl. 106-56.000.

Crabb, Jasper R., to Lobee Pump and Manufacturing Co. Automatic bagging machine. 3,789,573, Cl. 53-55.000.

Crabtree, Charles R. Machine feed and output monitoring apparatus. 3,790,761, Cl. 235-92.0pd.

Crall, Donald H. System for reefing and furling sails. 3,789,790, Cl. 114-106.000.

Cramton, Frank Richard, to Whiting, E.B. & A.C., Company. Method for commingling and orienting colored sets of thermoplastic filaments. 3,790,655, Cl. 264-210.00f.

Cranor, Dennis A., to Esco Corporation. Integral cast pin type chain. 3,789,607, Cl. 59-84.000.

Cranston, Lawrence: *See—*
Atwell, William J.; and Cranston, Lawrence, 3,790,419.

Crawford, Donald C.; and Besserdich, Orrin H., to FMC Corporation. Folding machine. 3,790,157, Cl. 270-62.000.

Craxton, Robert Trevor, to Autoflow Engineering, Limited. Digital to analogue converter. 3,790,875, Cl. 318-573.000.

Crepinsek, Alois, to Security Technology Corporation. Preassembled lock of the unit type. 3,789,633, Cl. 70-110.000.

Creusot-Loire: *See—*
Champeau, Andre, 3,790,141.

Criss, William H.; and Shackeleford, John R., to Stange Co. Method of applying liquid surface treating material to sausages. 3,790,685, Cl. 426-302.000.

Croft, W. Jack, to Wichita Engineering Co., Inc. Pecan harvesting machine. 3,789,592, Cl. 56-328.00r.

Cromer, George P., to General Electric Company. Battery coil construction. 3,790,408, Cl. 136-13.000.

Crosby, Lawton H., to Morley Furniture Spring Corporation. Spring construction. 3,790,149, Cl. 267-110.000.

Cross, Laurence Allan, Jr., to Randomatic Data Systems, Inc. SCR control circuit. 3,790,863, Cl. .

Cross River Products, Inc.: *See—*
Berg, Donald P.; and Groth, Hugh P., 3,789,439.

Crowe, Curtis W.: *See—*
Gurley, Derrel G.; and Crowe, Curtis W., 3,789,927.

Crown Controls Corporation: *See—*
Koeper, John I., 3,790,934.

Crown Zellerbach Corporation, mesne: *See—*
Herschler, Robert J.; and Jacob, Stanley W., 3,790,682.

Crump, Thomas R.: *See—*
Mayne, William Harry; and Crump, Thomas R., 3,790,929.

Cubitt, Robert D.: *See—*
Fitzpatrick, William E.; and Cubitt, Robert D., 3,790,017.

Cumberland Engineering Company, Inc.: *See—*
McIntyre, John W., 3,790,093.

Cumberland Engineering Company Limited, The: *See—*
Greaves, Bruce Bousfield, 3,790,464.

Cummins, Billy H.: *See—*
Mead, Theodore C.; Cummins, Billy H.; and Coleman, Richard L., 3,790,470.

Curtis, Gerald J. Cleat cleaner. 3,789,453, Cl. 15-237.000.

Custom Radius Corporation: *See—*
Norris, John F.; and Humphreys, Donald R., 3,789,551.

Cuthbert, John David; McMahon, Richard George; and Munro, David Farnham, said McMahon assor. to Western Electric Company and said Cuthbert and said Munro assors. to Bell Telephone Laboratories, Incorporated. Surface inspection with scanned focused light bems. 3,790,287, Cl. 356-120.000.

Cutter, Delbert M., to General Motors Corporation. Sprocket assembly. 3,789,687, Cl. 74-243.0dr.

CX Processing Laboratories, Inc.: *See—*
Tall, Leonard H.; Carlstedt, Paul A.; and Erickson, Arlen J., 3,789,571.

Cygned, Inc.: *See—*
Anderson, Richard W.; Weiss, Bernard J.; and Hulley, Hubert E., 3,790,938.

Da Silva, Herman, to De Staat der Nederlanden te Dezenvertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Simplex radiotelegraph system. 3,790,699, Cl. 178-2.00a.

Dada, Abdul G.; Dehollander, William R.; and Sloat, Robert J., to General Electric Company. Post oxidation process for uranium dioxide rich compositions. 3,790,493, Cl. 252-301.10r.

Daddon, Georges Edouard Louis Leon: *See—*
Mesnet, Jean Dominique Francois; Remon-Beauvais, Philippe Marie Antoine Jacques; Barbarin, Jean Francois; Le Guennec, Raymond Louis; and Daddon, Georges Edouard Louis Leon, 3,790,111.

Daggeem, Inc.: *See—*
Bowerfind, Albert L.; and Avilzer, Zvi, 3,789,533.

Dahlberg, John R.; Oravitz, James L., Jr.; and Michalik, Edmund R., to PPG Industries, Inc. Directional control for thermal severing of glass. 3,790,054, Cl. 225-93.500.

Dahlberg, John R.; ; Oravitz, James L.; and Michalik, Edmund R., to PPG Industries, Inc. Directional control for thermal serving of glass. 3,790,362, Cl. 65-174.000.

Dahle, Norman A., to Gulf Research & Development Company. Method of manufacturing dialkylamino-1,3,4-oxadiazoles and 1,3,4-thiadiazoles. 3,790,588, Cl. 260-306.80d.

Dahlman, Keith E., to Minnesota Mining and Manufacturing Company. Fluorinated polyamide-diazo resin coating composition. 3,790,382, Cl. 96-75.000.

Daiechi Seiyaku Co., Ltd.: *See—*
Oga, Shunichiro; Sato, Kiyoshi; Imada, Katsumi; and Asano, Kazuo, 3,790,444.

Daigle, Donald J.; Drake, George L., Jr.; and Reeves, Wilson A., to United States of America, Agriculture. Process for producing a water soluble methylol phosphine-phenol adduct. 3,790,639, Cl. 260-606.50p.

Daimler-Benz Aktiengesellschaft: *See—*
Barenyi, Bela, 3,789,944.
Marquardt, Friedbert, 3,789,611.

Damadian, Raymond V. Apparatus and method for detecting cancer in tissue. 3,789,832, Cl. 128-2.00r.

Damico, Ralph A.; and Laughlin, Robert G., to Procter & Gamble Company, The. Process for preparing α-amino acids. 3,790,598, Cl. 260-326.14t.

Danfoss A/S: *See—*
Nielsen, Erik; and Pedersen, Hans Christian (said Pedersen assor. to), 3,790,921.

Romer, Bendt Wegge; and Pedersen, Hans Kristian, 3,790,308.

Dao, Wolfram; Langer, Paul; and Gritzan, Hans, to Volkswagenwerk Aktiengesellschaft. Clutch assembly for a vehicle. 3,789,967, Cl. 192-111.00a.

Darenth Weighing Equipment, Limited: *See*—
Westwood, Herbert Wilfred, 3,789,873.

Date, Kazuo H., to McGraw-Edison Company. Spring changing switch operator with weld-breaking means. 3,790,731, Cl. 200-153.0sc.

Datta, Ranasit K.; and Luscher, Thomas W., to General Electric Company. Europium and manganese activated strontium chlorocilicate phosphor. 3,790,490, Cl. 252-301.40f.

Dauser, William C., to Heneveld, Lloyd A.; trustee of Dauser Trust IV. Electrical connector. 3,790,918, Cl. 339-97.00r.

Davidge, Harold, to British Oxygen Company Limited, The. Evaporation system. 3,789,616, Cl. 62-50.000.

Davies, James W., to Singer-General Precision Inc. Accelerometer. 3,789,672, Cl. 73-497.000.

Davis, Carlton John. King-pin actuated landing gear for road-haulage semi-trailers. 3,790,190, Cl. 280-430.000.

Davis, Harry G.: *See*—
Eddy, Gaines W.; Davis, Harry G.; Beroza, Morton; and McGovern, Terrence P., 3,790,666.

Davis, Pauls: *See*—
Vogt, Herwart C.; and Davis, Pauls, 3,790,625.

Davis, Steven J.; and Domyan, Stephen L., to General Datacomm Industries. Inductor-less telephone line holding circuit giving high A.C. shunt impedances. 3,789,803, Cl. 179-81.00r.

Dawson, William Grant: *See*—
Chivers, Malcolm; Dawson, William Grant; Masterman, Paul Henry; and Weston, Martin Andrew, 3,790,941.

Day-date advancing structure for a timepiece: *See*—
Nemotoi, Isao, 3,789,602.

Dayco Corporation: *See*—
Haley, John S.; Cooper, Jerry W.; and Logan, Arthur D., 3,790,437.

Dayton Steel Foundry Company, The: *See*—
De Regnaucourt, Robert A., 3,790,217.

De Chicchis, Antoni; Fennell, Harry C., Jr.; and Schwartz, David M., to ARK-Environmental Research Inc. Building structure. 3,789,562, Cl. 52-648.000.

De Gregory, Donald Lee, to Bell Telephone Laboratories, Incorporated. Push-pull fluidic logic element and drive unit. 3,789,883, Cl. 137-824.000.

De Long, Donald C.: *See*—
Gerzon, Koert; Ryan, Charles W.; and De Long, Donald C., 3,790,673.

De Regnaucourt, Robert A., to Dayton Steel Foundry Company, The. Clamp lugs and carrier ring for a rim and wheel assembly. 3,790,217, Cl. 301-12.00r.

De Roissart, Henri: *See*—
Duprat, Jacques; and De Roissart, Henri, 3,789,515.

De Staat der Nederlanden te Dezenvertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: *See*—
Da Silva, Herman, 3,790,699.

De Vita, Raymond A.; Romeo, Vincent P.; and Carney, James E., to USM Corporation. Apparatus for feeding printed circuit boards. 3,789,483, Cl. 29-203.00b.

De Wald, Horace A., to Parke Davis & Company. 9 Substituted 4. 9 dihydro 1,3,4,4 tetralkyl 1H-pyrazolo-[3,4-b] quinolines. 3,790,576, Cl. 260-286.00r.

Debaets, Michael P., to Columbia Gas System Service Corporation. System for printing out the metered flow of a fluid daily or for other predetermined periods of time. 3,790,952, Cl. 346-33.00r.

DeChassy, Christian; and Capdebosco, Andre, to Entreprise de Recherches et d'Activites Petrolieres (ELF). Device for off-centering above-water articulated multiple-drilling structures. 3,789,921, Cl. 166-.500.

Dedek, Frank G., to Burroughs Corporation. Method for forming articles from powdered metal. 3,790,374, Cl. 75-208.00r.

Deering Milliken Research Corporation: *See*—
Bylund, Don M., 3,790,426.
Young, William O., Jr.; and Quattlebaum, Walter J., 3,790,424.

Dehm, Henry C., to Hercules, Incorporated. Composite propellant including (U) polyfunctional amine. 3,790,416, Cl. 149-19.100.

Dehollander, William R.: *See*—
Dada, Abdul G.; Dehollander, William R.; and Sloat, Robert J., 3,790,493.

Delany, John J.; and Liebmann, John M., to Research Products Corporation. High performance filter assembly. 3,789,589, Cl. 55-481.000.

Demny, Helmut, to Maschinenfabrik Alfred Schmermund. Web feeding and cutting arrangements. 3,789,714, Cl. 83-272.000.

Demoute, Jean-Pierre: *See*—
Perronnet, Jacques; and Demoute, Jean-Pierre, 3,790,570.

Demozay, Daniel; Pillon, Daniel; and Ducret, Jacques, to Pepro Societe pour le Development et la Vente de Specialites Chimiques. Certain pyridylphosphates, thiophosphates, phosphonates and thiophosphonates. 3,790,582, Cl. 260-294.80k.

Demuria, Nazi Vladimirovna; and Agladze, Ilich. Method of electrochemical processing of manganese ores and their concentration wastes. 3,790,458, Cl. 204-96.000.

Denham, Frank M.: *See*—
Goodman, Brian L.; Higgins, Robert B.; and Denham, Frank M., 3,790,142.

Deniega, Jose Castillo, to Stop-Motion Devices Corporation. Yarn tension control device. 3,789,631, Cl. 66-163.000.

Denki Onkyo Co., Ltd.: *See*—
Kawada, Takehiko, 3,790,826.

Deny, Janos: *See*—
Sims, Anson; Stastny, Edwin O.; and Deny, Janos, 3,789,542.

Der Estephanian, Estephan. Fabric cutter and method. 3,790,071, Cl. 234-1.000.

Deres Development Corporation: *See*—
Lipert, Donald Ernest, 3,790,150.

Dergling, Folke Gunnar, to SKF Industrial Trading and Development Company, B.V. Device for mounting and dismounting a stern post bearing. 3,790,356, Cl. 29-201.000.

Desma-Werke GmbH: *See*—
Koch, Friedrich; and Zeug, Hubert, 3,790,136.

Dessus, Benjamin; Migne, Jacques; and Catherin, Jean-Michel, to Compagnie Generale d'Electricite. Discharge tube. 3,790,899, Cl. 331-94.500.

Deutsch Relays, Inc.: *See*—
Dugan, Alanson G.; and Lockyer, John, 3,790,915.

Devenney, Robert F.: *See*—
Blackburn, Dale W.; Devenney, Robert F.; and Jen, Timothy Yu-Wen, 3,790,573.

Devore, Ernest W.; and Irwin, John W., to International Business Machines Corporation. Skew controlled readback systems. 3,790,954, Cl. 340-146.10f.

Dexter Automatic Products Co., Inc.: *See*—
Tupper, Willis E., 3,789,871.

Dexter, Martin; Knell, Martin; and Peterli, Hans Jakob, to Ciba-Geigy Corporation. Sulfur derivatives of alkylhydroxyphenyl maleimides and compositions thereof. 3,790,597, Cl. 260-326.50s.

Deyesso, Joseph P.; and Palombo, Gaston A., to Honeywell Information Systems, Inc. Servo control system for a serial printer print head. 3,789,971, Cl. 197-18.000.

Dhein, Rolf: *See*—
Rosenbaum, Heinz Jorg; Rudolph, Hans; Dhein, Rolf; and Reinking, Klaus, 3,790,516.

di Giovanoel, Gaudenz Girell; and Zweidler, Reinhard, to Ciba-Geigy Corporation. Spinning solution comprising a polyamide, polyester or polyolefin and an optical brightener. 3,790,491, Cl. 257-301.0zw.

Diamond International Corporation: *See*—
Kramer, Robert G., 3,790,064.

Diamond Shamrock Corporation: *See*—
Sellet, Lucien, 3,790,606.

Diana, Guy D., to Sterling Drug Inc. Carbimidoyl ureas. 3,790,631, Cl. 260-553.00a.

Dickerson, James C. Soft tube stretcher. 3,789,651, Cl. 72-367.000.

Dickson, Joseph F., to Reed Rolled Thread Die Company. Double angle cutoff die and method for rolling screws. 3,789,643, Cl. 72-469.000.

Didycz, William J.; and Glassman, Donald, to United States Steel Corporation. Method of purifying waste fluid. 3,790,448, Cl. 201-39.000.

Diehr, Hans-Joachim, to Bayer Aktiengesellschaft. Process for the production of synthetic resins which contain isocyanuarate groups. 3,790,509, Cl. 260-2.5aw.

Dietch, Leonard, to Zenith Radio Corporation. Rectangular grade black surround screen. 3,790,839, Cl. 313-92.00r.

Dir, Gary A.: *See*—
Wysocki, Joseph J.; Becker, James H.; and Dir, Gary A., 3,790,251.

Diskus, Alfred; Schonbeck, Rupert; Kloimstein, Engelbert; and Mayr, Hubert, to Osterreichische Stickstoffwerke Aktiengesellschaft. Phenylpyridazines. 3,790,571, Cl. 260-250.00a.

Ditzig, Albert F., to Controls Company of America. Timer positioning mechanism. 3,789,701, Cl. 74-813.00r.

Dixon, R. G., & Company, Limited: *See*—
Robbins, John Lyndon; and Bridge, Samuel Douglas, 3,789,554.

Doane, John C.; Holz, George E.; Ogle, James A.; and Samlyody, Arpod, to Burroughs Corporation. Apparatus for operating multiple position display tubes. 3,790,850, Cl. 315-169.0tv.

Dobkin, Robert C., to National Semiconductor Corporation. Schottky clamped TTL circuit. 3,790,817, Cl. 307-214.000.

Doerfer Corporation: *See*—
Doerfer, Richard E.; Leymaster, Homer N.; and Neebel, Richard R., 3,789,456.

Doerfer, Richard E.; Leymaster, Homer N.; and Neebel, Richard R., to Doerfer Corporation. Rib cutting apparatus. 3,789,456, Cl. 17-1.00r.

Doggett, Towers, to Scott Paper Company. Organic solvent soluble diazonium compounds formed from anionic sulfate or sulfonate surfactants. 3,790,556, Cl. 260-141.000.

Dohany, Julius Eugene; and Whiton, Alfred Case, to Pennwalt Corporation. Elastomeric fluorinated terpolymer having good thermal stability. 3,790,540, Cl. 260-80.770.

Doittau, Francois-Xavier; Ythier, Jean-Pierre; and Hebert, Marcel, to U.S. Philips Corporation. Device for measuring a time interval. 3,790,890, Cl. 324-189.000.

Dolby, William Berkeley, mesne: *See*—
Robertson, Roderick, 3,789,941.

Dollfus-Mieg & Cie: *See*—
Bernard, Christian, 3,789,430.

Dome, Peter, to Societe Suisse pour l'Industrie Horlogere SA. Correction of errors occurring in electronic timepieces. 3,789,599, Cl. 58-23.00r.

Domyan, Stephen L.: *See—*
Davis, Steven J.; and Domyan, Stephen L., 3,789,803.

Donahue, Stephen F.: *See—*
Glass, Max E.; Donahue, Stephen F.; and Carlson, Arthur, Jr., 3,790,665.

Donner, Frederic Arno. Fin-stabilized projectile for launchers, mortars and the like. 3,789,763, Cl. 102-49.200.

Donohue, James M., to Xerox Corporation. Registration reset system. 3,790,270, Cl. 355-14.000.

Donohue, James M., to Xerox Corporation. Processing control system for printing machines. 3,790,271, Cl. 355-14.000.

Dorn, Conrad P., Jr.: *See—*
Sarett, Lewis H.; Shen, Tsung-Ying; and Dorn, Conrad P., Jr., 3,790,676.

Dorval, Bertrand: *See—*
Chevalier, Paul; Menard, Claude; and Dorval, Bertrand, 3,790,768.

Doskocil, Patricia A., 20% to Lee, Raymond, Organization, Inc., The. Stove protector. 3,789,823, Cl. 126-42.000.

Doster, William H.: *See—*
Callins, Harold I.; and Doster, William H., 3,789,502.

Douglas, Lloyd A.; and Garanelo, Kirk T., to Victor Equipment Company. Compressed gaseous fuel system. 3,789,820, Cl. 123-276.00e.

Douri, Hisashi, to Yoshida Kogyo Kabushiki Kaisha. End-stop applying apparatus for concealed zip fasteners. 3,789,486, Cl. 29-207.55t.

Dover Corporation: *See—*
Getty, John A., Jr., 3,790,130.
Ostand, Paul R.; and Guertin, Robert W., 3,790,126.

Dow Chemical Company, The: *See—*
Allemang, Arnold A.; and Bachtel, Howard J., 3,789,580.
Edamura, Fred Y.; and Giacobbe, Thomas J., 3,790,619.
Gurley, Derrel G.; and Crowe, Curtis W., 3,789,927.
McCann, Gordon D.; and Dumitru, Earl T., 3,790,521.
Routson, Willis G., 3,789,613.
Shea, Philip J., 3,790,679.

Dowty Boulton Paul Limited: *See—*
Hall, John, 3,789,736.

Dozier, Leonard C., to North America Rockwell Corporation. Brake control system. 3,790,227, Cl. 303-21.0be.

Drackett Company, The: *See—*
Drappeu, Robert E.; Gould, Hughjean Burton; and Maust, Daniel A., 3,789,454.

Drake, George L., Jr.: *See—*
Daigle, Donald J.; Drake, George L., Jr.; and Reeves, Wilson A., 3,790,639.

Drappeu, Robert E.; Gould, Hughjean Burton; and Maust, Daniel A., to Drackett Company, The. Carpet sweeper. 3,789,454, Cl. 15-41.00r.

Dreibelbis, Richard C.: *See—*
Rifkin, Ernest; and Dreibelbis, Richard C., 3,790,075.

Dresser Industries, Inc.: *See—*
Adamson, Gerald P., 3,790,821.
Bissell, Robert D., 3,789,668.
Smith, William Stephens, 3,789,706.

Drori, Mordeki. Strainer for liquid pipe lines. 3,789,990, Cl. 210-310.000.

Droske, Donald J., to Dura Corporation. Overload release device for a motor drive. 3,789,690, Cl. 74-411.000.

Dryczynski, Kurt; Kramer, Heinz; Messner, Dieter; and Seifried, Walter, to Kalle Aktiengesellschaft. Apparatus for removing static charge from webs of material. 3,790,854, Cl. 317-2.00f.

Du Pont de Nemours, E. I., and Company: *See—*
Bellina, Russell F., 3,790,566.
Campbell, John B.; Cluff, Edward Fuller; and Sarafidis, Christos, 3,790,480.
Iwasyk, John M.; and Rodeffer, David W., 3,789,584.
Orvis, Gary W., 3,790,523.
Ribbans, Robert Clark, III, 3,790,403.
Tomio, Ernst A., 3,790,415.
Victorius, Claus, 3,790,513.

Duca, William J., to Ajax Magnethermic Corporation. Rear slagging for induction furnace. 3,790,338, Cl. 432-247.000.

Ducret, Jacques: *See—*
Demozay, Daniel; Pillon, Daniel; and Ducret, Jacques, 3,790,582.

Dugan, Alanson G.; and Lockyer, John, to Deutsch Relays, Inc. Mounting arrangement for electrical plug-in components. 3,790,915, Cl. 339-88.00r.

Duhaut, Pierre; Guillemat, Jean; and Miquel, Jean, to Institut Francais du Petrole des Carburants et Lubrifiants. Platinum-iridium-zinc catalyst for the conversion of hydrocarbons. 3,790,504, Cl. 252-466.0pt.

Dukes, Lee R.: *See—*
Dukes, Lee R.; and Witt, William W. (said Witt assor. to said), 3,790,957.

Dukes, Lee R.; and Witt, William W., said Witt assor. to said Dukes, Lee R. Key automated data collection, control and source information system. 3,790,957, Cl. 340-149.10r.

Dumitru, Earl T.: *See—*
McCann, Gordon D.; and Dumitru, Earl T., 3,790,521.

Dunkerley, Kenneth: *See—*
Cheetham, Ian; Dunkerley, Kenneth; Greenhalgh, Colin William; and Phillips, Duncan Adrian Sidney, 3,790,604.

Duprat, Jacques; and De Roissart, Henri, to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Apparatus for conditioning lyophilised products. 3,789,515, Cl. 34-92.000.

Dura Corporation: *See—*
Droske, Donald J., 3,789,690.
Kalitta, Carl L., 3,790,200.

Duroux, Jean. Processes and apparatus for the investigation of internal physiological phenomena based on measurements of the impedance variation of the surface of the body. 3,789,834, Cl. 128-2.120.

Dusseau, Andress: *See—*
Kim, Sung Soo; and Dusseau, Andress, 3,789,852.

Dy Tampella Ab: *See—*
Collanus, Heikki, 3,789,464.

Dynachem Corporation: *See—*
Gilano, Michael N., 3,790,392.

Dynamit Nobel Aktiengesellschaft: *See—*
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 3,790,459.
Richter, Ulf, 3,790,354.
Schultz, Neithart; Vahlensieck, Hans-Joachim; and Martens, Peter, 3,790,462.

Dyrud, James F.: *See—*
La Perre, James D.; Dyrud, James F.; and Zosel, Thomas W., 3,790,439.

E-Systems, Inc.: *See—*
Pickles, Sidney; and Thornberg, Dean S., 3,790,943.

Eagle Range and Manufacturing Company: *See—*
Baltz, Albert L.; and Voeke, Elmer E., 3,789,826.

Eakins, William S. Apparatus and method for continuous filtering. 3,789,985, Cl. 210-77.000.

Earl, Christopher B.; and Hughes, Fred, to Wellman-Lord, Inc. Process for recovering sulfur dioxide from gases. 3,790,660, Cl. 423-242.000.

Earl, T. Desmond, to Textron, Inc. Air cushion type undercarriage. 3,790,110, Cl. 244-110.00h.

Earle, Ernest L., Jr.: *See—*
Pitchon, Esra; and Earle, Ernest L., Jr., 3,790,689.

Easterday, Ralph E.: *See—*
Fox, Charles S.; and Easterday, Ralph E., 3,790,115.

Eastes, Frank E., to Grace, W. R., & Co. Saran-aluminum silicate coating. 3,790,402, Cl. 117-68.000.

Eastman Kodak Company: *See—*
Barkey, Kenneth T.; Gandy, Gerald C.; and May, Douglas C., 3,790,653.
Brown, Barry M.; and Ray, Elbert L., 3,789,993.
Hopfner, Clemens; and Ort, Wolfgang, 3,790,268.
Huboi, Robert W.; Palmer, Osmond F.; and Waz, Edward M., 3,790,275.
Muslimer, Walter J., 3,790,387.
Pickering, Royce Dean, 3,790,246.
Valenta, Harry L., Jr., 3,790,707.
Weaver, Max A.; and Straley, James M., 3,790,557.

Eaton Corporation: *See—*
Franz, Rudolph J.; Freismuth, John S.; and Benedetti, Nello L (said Franz and said Freismuth assors. to), 3,789,811.
Moran, Thomas M., 3,789,724.
Moran, Thomas M., 3,789,727.

Eaton, David L., to Corning Glass Works. Porous glass support material. 3,790,475, Cl. 210-31.00c.

Eckardt, J. C., AG: *See—*
Bader, Horst, 3,789,884.

Ecodync Corporation: *See—*
Askew, Anthony A., 3,789,578.
Goodman, Brian L.; Higgins, Robert B.; and Denham, Frank M., 3,790,142.
Huber, Ferdinand V., 3,789,919.

Economou, Peter, to American Cyanamid Company. Amphoteric strengthening agents for paper. 3,790,514, Cl. 260-17.4st.

Edamura, Fred Y.; and Giacobbe, Thomas J., to Dow Chemical Company, The. Fluoride substituted carbanilates. 3,790,619, Cl. 260-471.00c.

Eddy, Gaines W.; Davis, Harry G.; Beroza, Morton; and McGovern, Terrence P., to United States of America, Agriculture. Cis-3-hexeryl butyrate as an attractant for yellow jackets. 3,790,666, Cl. 424-84.000.

Eddy Match Company, Limited: *See—*
Stegeman, Berend, 3,790,024.

Edenhofer, Albrecht; and Spiegelberg, Hans, to Hoffmann-La Roche Inc. Certain [3-(4-phenyl)-1-(2H) 3,6-dihydropyridyl]-propyl(thio) halides, sulfonamido anilides, anilines and derivatives. 3,790,583, Cl. 260-294.80g.

Edmonson, Fay R., to United States Steel Corporation. Discharge collector for fluid cooled roll. 3,789,882, Cl. 137-802.000.

Edstrom, Carl M.: *See—*
Snodgrass, Robert H.; Carter, James R.; and Edstrom, Carl M., 3,789,497.

Efka-Werke Fritz Kiehn GmbH: *See—*
Brodbeck, Helmut, 3,790,025.

Egerbork, Bo Malte S.; Gadefelt, Goran R.; Hagbjer, Gunnar Ingemar; and Spang, Kjett Knut I., to Akustikobyran AB. Vibrator damping of vehicle path. 3,790,078, Cl. 238-2.000.

Egger, Hermann. Method and apparatus for the sterile packaging of substances. 3,789,569, Cl. 53-28.000.

Eickman, Karl. Hydraulically controlled fluid stream driven vehicle. 3,790,105, Cl. 244-12.00r.

Eisenberg, Herbert: *See—*
Callais, Richard T.; Eisenberg, Herbert; Forbes, F. Douglas; Kosco, Thomas J.; Taxin, Harry M.; and Frost, John B., 3,790,700.

El-Hindi, Ahmad M., to Filter Tech, Inc. Removal of air and water from oil. 3,789,579, Cl. 55-50.000.

Eldert, Cornelius, to Burroughs Corporation. Capacitive read only memory. 3,790,959, Cl. 340-172.500.

Electroacustic GmbH: *See—*
Ahrens, Erhard, 3,790,925.

Ellett, James R. Toggle linkage valve actuator. 3,790,124, Cl. 251-58.000.

Elliott, Robert L. Hydraulic control means for check valves. 3,789,872, Cl. 137-514.000.

Ellis, George R.: *See—*
Hruschak, Joseph P.; and Ellis, George R., 3,790,958.

Ellis, John Ernest: *See—*
Carrotte, Frederick Henry; and Ellis, John Ernest, 3,789,629.

Elwood, Michael J.: *See—*
Summers, James E.; and Elwood, Michael J., 3,790,158.

Emanuelsson, Kaj Bengt Ingemar; and Arnegard, Bo Olof Roland, to Atlas Copco Aktiebolag. Rotary piston compressors with liquid injection. 3,790,315, Cl. 418-97.000.

Emelyanenko, July Georgievich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georievich, 3,790,691.

Emerson, Carl D.: *See—*
Aichenegg, Paul C.; and Emerson, Carl D., 3,790,683.

Emerson Electric Co.: *See—*
Frank, Heinrich H., 3,789,640.

Emery, Norman B. Power lawnmower with auxiliary flexible drive shaft for edger head. 3,789,591, Cl. 56-16.900.

Empire Plating Company, The: *See—*
Palisin, Stephen P., Jr., 3,790,355.

Enders, George E., to NRM Corporation. Apparatus for severing tire ply stock and the like. 3,789,712, Cl. 83-171.000.

Endo Laboratories, Inc., mesne: *See—*
Blumberg, Harold, 3,790,675.

Endres, Wilhelm, to Aktiengesellschaft Brown, Boveri & Cie. Gas turbine bucket. 3,790,303, Cl. 416-241.000.

Enercon Corporation International: *See—*
Stephenson, Robert A.; and Zoch, Robert M., Jr., 3,790,139.

Engert, Fred O., to Chance, A. B., Company. Detachable bushing. 3,790,698, Cl. 174-152.00r.

Enjalbert, Roger: *See—*
Bert, Alain; Enjalbert, Roger; and Kern, Pierre, 3,790,843.

Ennis, Thomas E., to GTE Automatic Electric Laboratories, Incorporated. Film switching system for mutually isolated circuits. 3,790,813, Cl. 307-115.000.

Enomoto, Koji; Ohtsuka, Kunio; and Ishimaru, Wataru, to Nissan Motor Company, Limited. Fluid pressure governor valve. 3,789,863, Cl. 137-54.000.

Entreprise de Recherches et d'Activites Petrolieres (ELF): *See—*
DeChassy, Christian; and Capdebosco, Andre, 3,789,921.

Environment/One Corporation: *See—*
Peters, Philip H., Jr., 3,790,735.
Rich, Theodore A., 3,790,887.
Skala, George Frank, 3,790,279.

Erbstein, Robert S.: *See—*
Bernstein, Barry E.; Erbstein, Robert S.; and Pazis, Thomas, 3,789,595.

Erickson, Arlen J.: *See—*
Tall, Leonard H.; Carlstedt, Paul A.; and Erickson, Arlen J., 3,789,571.

Ericsson, Konrad E., to Arbman Development AB. Apparatus for individually feeding sheets, cards, banknotes and the like. 3,790,161, Cl. 271-117.000.

Eron, Robert E. Foamed cover composition. 3,790,395, Cl. 106-122.000.

Erwin Sick Optik-Elektronik: *See—*
Muller, Joachim M.; and Triller, Adolf J., 3,790,290.

Esco Corporation: *See—*
Cranor, Dennis A., 3,789,607.

Esplin, William E. Fishing pole and reel assembly. 3,789,535, Cl. 43-22.000.

Esso Research and Engineering Company: *See—*
Feldman, Nicholas, 3,790,359.
Fiocco, Robert J.; and Wilson, Edward L., 3,790,467.
Langer, Arthur W., Jr., 3,790,541.
Rossi, Albert; Jacobson, Norman; and Miller, Harold N., 3,790,358.
Song, W. R.; and Jacobson, Norman, 3,790,483.

Etablissements Carpano & Pons S.A.: *See—*
Pochard, Michel Adrien, 3,790,082.

Etat Francais: *See—*
Mesnet, Jean Dominique Francois; Remon-Beauvais, Philippe Marie Antoine Jacques; Barbarin, Jean Francois; Le Guennec, Raymond Louis; and Daddon, Georges Edouard Louis Leon, 3,790,111.

Etat Francois represente Pai le Ministre d'Etat Sharge de la, Defense Nationale Delegation: *See—*
Aupy, Roland Rolland, 3,789,729.

Ethyl Corporation: *See—*
Niebylski, Leonard M.; and Jarema, Chester P., 3,790,365.
Niebylski, Leonard M., 3,790,367.

Ets J.J. Carnaud & Forges de Basse-Indre: *See—*
Petit, Maurice; and Thomas, Georges, 3,789,785.

Everitt, Scott F., to Acoustic Fiber Sound Systems, Inc. Sound reproduction system. 3,789,953, Cl. 181-31.00b.

Ex-Cell-O Corporation: *See—*
Bondie, Dale J.; Sutton, Robert W.; and Lewelling, James L., 3,789,500.

Fa. Tukiem Trust: *See—*
Magerle, Otto, 3,790,313.

Fabien, Lionel Ralph: *See—*
Conn, Jack Samuel; and Fabien, Lionel Ralph, 3,789,861.

Fahralloy Company, The: *See—*
Annal, James M., 3,789,995.

Fancher, Llewellyn W., to Stauffer Chemical Company. Cinnamyl carbamates and their utility as herbicides. 3,790,363, Cl. 71-106.000.

Fane, William J.: *See—*
Sanders, Vernard W.; and Fane, William J., 3,790,196.

Fangel, Henning. Recovery of ores and minerals while using ice as means of support in mined rooms. 3,790,215, Cl. 299-11.000.

Fannin, Richard C., to Bendix Corporation, The. Emergency release system for fluid pressure brakes. 3,790,222, Cl. 303-9.000.

Far-Mar-Co., Inc.: *See—*
Rao, Ganta V.; and Gerrish, Oliver B., Sr., 3,790,553.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Frickenhaus, Gerrit; Meister, Martin; Pantke, Hellmuth; and Schuffenhauer, Erhard, 3,790,344.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Kleiner, Hans-Jerg, 3,790,638.
Konig, Wolfgang; and Geiger, Rolf, 3,790,618.
Quietzsch, Gerhard; Greiner, Bernd; Hund, Helmut; Nottebohm, Harald; and Pelz, Lothar, 3,790,457.
Weyer, Rudi; Aumuller, Walter; Weber, Helmut; Muth, Karl; and Schmidt, Felix Helmut, 3,790,630.

Farhat, Nabil H.; and Kopeika, Norman S., to University of Pennsylvania. Glow discharge millimeter wave detector and method of biasing same. 3,790,895, Cl. 329-157.000.

Farkas, Eugene: *See—*
Kraay, Russell J.; and Farkas, Eugene, 3,790,605.

Farkas, Paul, to Thomas & Betts Corporation. Container. 3,790,018, Cl. 220-4.00c.

Farr, Alton E.; and Wood, Dorin A., to McDonnell Douglas Corporation. Spoiler controlling mixer. 3,789,692, Cl. 74-480.00r.

Farrar, Edward A.: *See—*
Wasserman, Seymour; Cirulli, Albert; and Farrar, Edward A., 3,789,747.

Farris, Charles D.: *See—*
United States of America, National Aeronautics and Space Administration, 3,790,409.

Fathauer, Jack E.; and Gottlieb, Carl R., to Midland-Ross Corporation. Hoisting equipment including spreader with longitudinal and transverse tilting mechanism. 3,789,998, Cl. 212-125.000.

Faust, Silwart W.; and Kuhn, L. Dean, to Maytag Company, The. Bulkhead filter assembly. 3,789,514, Cl. 34-82.000.

Favre, Robert. Gas-pressure sensor. 3,789,666, Cl. 73-398.00r.

Faye, Andre. Magnetic tape cartridge dialer. 3,790,722, Cl. 179-90.0bb.

Fearon, Edward R., to Stoplifter International, Inc., mesne. Open-strip ferromagnetic marker and method and system for using same. 3,790,945, Cl. 340-280.000.

Fedders Corporation: *See—*
Bellmer, Thomas J., 3,790,148.

Federichi, George J.: *See—*
Noren, Tore H.; and Federichi, George J., 3,789,877.

Feinman, Harvey: *See—*
Laserson, Gregory L.; Feinman, Harvey; Stand, Mille; Glatzer, Stephen G.; and Scappatura, Rocco, 3,790,727.

Feiss, Rene T., to Sulzer Brothers Ltd. Apparatus for mounting a pipe in a perforated plate. 3,790,060, Cl. 228-3.000.

Feit, Peter Werner; and Nielsen, Ole Bent Tvaermose, to Lovens Kemiske Fabrik Produktionsaktieselskab. Sulfamylbenzoic acids. 3,790,584, Cl. 260-294.80f.

Feldman, Nicholas, to Esso Research and Engineering Company. Middle distillate fuel having increased low temperature flowability. 3,790,359, Cl. 44-62.000.

Feliz, Jack M. Auxiliary drive for engine driven air conditioner. 3,789,618, Cl. 62-236.000.

Feniak, George, to Polymer Corporation Limited. Terminally reactive polymers. 3,790,549, Cl. 260-94.800.

Fenne, Ivor: *See—*
Asbery, John Harrison; and Fenne, Ivor, 3,789,818.

Fennell, Harry C., Jr.: *See—*
De Chicchis, Antoni; Fennell, Harry C., Jr.; and Schwartz, David M., 3,789,562.

Ferguson, Emery J. Purse seine cable ring. 3,789,532, Cl. 43-14.000.

Fernseh G.m.b.H.: *See—*

Kamin, Gerhard Robert, 3,790,705.
Ferranti Limited: *See—*
Brown, Kenneth Robson, 3,790,766.
Fibreglass Limited: *See—*
Ashall, Ronald James, 3,790,441.
Ashall, Ronald James, 3,790,442.
Fick, Bernard E.; and Yamasaki, Kim, to Brunswick Corporation. Model 2600 camping stove design. 3,789,821, Cl. 126-38.000.
Fielding, George H., to United States of America, Navy. Flame-in-engine photometer detector and alarm for phosphorus and other elements. 3,790,282, Cl. 356-86.000.
Fikutani, Hideo; Tokizawa, Makoto; and Okada, Hiroyoshi, to Mitsubishi Chemical Industries, Ltd. Novel cured epoxy resin composition. 3,790,532, Cl. 260-78.4ep.
Filipowicz, Edwin A., to Griffith-Hope Company. Cup dispenser with radially adjustable cup supporting tabs. 3,790,023, Cl. 221-304.000.
Filkorn, Robert L., to General Electric Company. Apparatus for shearing weld flash. 3,790,058, Cl. 228-2.000.
Filter Tech, Inc.: *See—*
El-Hindi, Ahmad M., 3,789,579.
Fine, Harry H. Drum seal gasket. 3,790,020, Cl. 220-46.00r.
Fiocco, Robert J.; and Wilson, Edward L., to Esso Research and Engineering Company. Coal liquefaction solids removal. 3,790,467, Cl. 208-8.000.
Firth, Francis G.: *See—*
Lent, Robert R.; and Firth, Francis G., 3,789,791.
Fisch, Richard S.; and Newman, Norman, to Minnesota Mining & Manufacturing Company. Alkaline photographic developer concentrate. 3,790,381, Cl. 96-66.100.
Fischer, C. Fink. Amphibious undercarriage for aircraft. 3,790,109, Cl. 244-105.000.
Fisons Limited: *See—*
Johnson, Peter Bennett; and Lee, Thomas Brian, 3,790,580.
Fitton, Robert C., to Huber, J. M., Corporation. Method for stabilizing pigment slurries. 3,790,396, Cl. 106-288.00b.
Fitzpatrick, William E.; and Cubitt, Robert D., to International Playtex Corporation. Nursing unit. 3,790,017, Cl. 215-11.00e.
Fives Lille-Cail: *See—*
Ratcli, Roger, 3,789,623.
Flanigan, Charles Dennis, to Overly Manufacturing Company. Therapeutic exercise device. 3,790,164, Cl. 272-57.00r.
Flannigan, William Tait, to Imperial Chemical Industries Limited. Foamable plastisol composition containing a foam stabilizer and foamed composition obtained therefrom. 3,790,510, Cl. 260-2.50p.
Flexicore Co., Inc., The: *See—*
Wise, Mark J., 3,790,120.
Flinchbaugh, Donald E.: *See—*
Zifferer, Morton F.; and Flinchbaugh, Donald E., 3,789,479.
Floessel, Dieter; and Mauthe, Gerhard, to Brown, Boveri & Company, Limited. Electrical insulator of porous expanded plastics material. 3,790,695, Cl. 174-28.000.
Flouret, George Rogelio, to Abbott Laboratories. Heptapeptide intermediate to gonadotropen-releasing hormone. 3,790,554, Cl. 260-112.500.
Flouret, George Rogelio; and Cole, John Wayne, to Abbott Laboratories. Octapeptide derivatives of gonadotropin-releasing hormone. 3,790,555, Cl. 260-112.500.
Fluid Controls, Inc.: *See—*
Swatty, Eugene E., 3,790,125.
FMC Corporation: *See—*
Crawford, Donald C.; and Besserdich, Orrin H., 3,790,157.
Graves, Kenneth E.; Madsen, Kay; and Schmidt, Warren J., 3,790,756.
Hallberg, Daniel P., 3,789,741.
Focella, Antonino: *See—*
Brossi, Arnold; Focella, Antonino; and Teitel, Sidney, 3,790,636.
Foderaro, Anthony J., to Picker Corporation. Mobile X-ray unit. 3,790,805, Cl. 250-522.000.
Fontaine, John G. Control system for brakes. 3,790,223, Cl. 303-19.000.
Forbes, F. Douglas: *See—*
Callais, Richard T.; Eisenberg, Herbert; Forbes, F. Douglas; Kosco, Thomas J.; Taxin, Harry M.; and Frost, John B., 3,790,700.
Ford, James A., to Olin Corporation. Process for improving heat transfer efficiency and improved heat transfer system. 3,789,915, Cl. 165-1.000.
Ford, James W. Implement for piercing ear-lobes. 3,789,850, Cl. 128-329.000.
Ford Motor Company: *See—*
Baker, John R.; and Fox, George, 3,789,693.
Boaz, Premakaran T.; and Surowiex, Roman, 3,790,752.
Forkardt, Paul, Kommanditgesellschaft: *See—*
Scharfen, Hans, 3,790,181.
Foster Grant Co., Inc.: *See—*
Leblanc, Conrad L., 3,790,259.
Foster Wheeler Corporation: *See—*
Gorzegno, Walter P., 3,789,806.
Fourneau, Jean-Pierre, to Laboratories Houde. Condensation products of glyoxylic acid esters with aminothiols. 3,790,623, Cl. 260-481.00r.
Fournier, Erick-Pierre; and Lomeo, Alberto. Force transmitting intrauterine device. 3,789,838, Cl. 128-130.000.
Fox, Charles S.; and Easterday, Ralph E., said Fox assor. to said Easterday, Ralph E. Base for air conditioning condenser apparatus. 3,790,115, Cl. 248-19.000.
Fox, George: *See—*
Baker, John R.; and Fox, George, 3,789,693.
Fox, Gerald B.: *See—*
Katterheinrich, Fred H.; and Fox, Gerald B., 3,789,860.
Fox, Joseph S.; and Koetting, Jerome D., to Union Carbide Corporation. Purification process for recovering uranium from an acidic aqueous solution by pH control. 3,790,658, Cl. 423-15.000.
Fr. Hesser Maschinenfabrik AG: *See—*
Bahr, Siegmund; and Saur, Walter, 3,790,040.
Frakowski, John F., to Methods, Inc. Method and apparatus for increasing portion yield from industry standard frozen fish blocks. 3,789,459, Cl. 17-52.000.
Frangiudakis, Emmanuel, 1/2 to Frangos, John W. Hydraulic actuator for dual braking system. 3,789,962, Cl. 188-345.000.
Frangos, John. Aerosol valve construction. 3,790,089, Cl. 239-573.000.
Frangos, John W.: *See—*
Frangiudakis, Emmanuel, 3,789,962.
Frank, Heinrich H., to Emerson Electric Co. Hand held tube bender. 3,789,640, Cl. 72-36.000.
Franz, Edmund C.: *See—*
Anderson, William A.; and Franz, Edmund C., 3,790,452.
Franz, Rudolph J.; Freismuth, John S.; and Benedetti, Nello L; deceased (by Benedetti, Lena; executor), said Franz and said Freismuth assors. to Eaton Corporation. Emissions reduction vacuum control valve. 3,789,811, Cl. 123-117.00a.
Frattarola, Joseph Ralph: *See—*
Hannan, William James; and Frattarola, Joseph Ralph, 3,790,245.
Frazier, Larry Vane W., to United States of America, Navy. Buoy construction. 3,789,445, Cl. 9-8.00r.
Free, Bernard A., to Communications Satellite Corporation. Type of colloid propulsion. 3,789,608, Cl. 60-202.000.
Freeman Supply Company, The: *See—*
Rusk, Gerald R.; and Koch, Robert E., 3,789,912.
Freier, Edward, Jr., to Simplicity Manufacturing Company. Air cooled shuttle clutch transmission. 3,789,684, Cl. 74-230.17d.
Freismuth, John S.: *See—*
Franz, Rudolph J.; Freismuth, John S.; and Benedetti, Nello L, 3,789,811.
Frickenhaus, Gerrit; Meister, Martin; Pantke, Hellmuth; and Schuffenhauer, Erhard, to Farbenfabriken Bayer Akticngesellschaft. Agents for improving the fastness to wet processing. 3,790,344, Cl. 8-165.000.
Fridman, Evl Gershkovich: *See—*
Afanasiev, Alexandr Dmitrievich; Lykov, Alexei Gavrilovich; Mogilevsky, Alexandr Moiseevich; Sokolov, Leonid Pavlovich; and Fridman, Evl Gershkovich, 3,789,974.
Friel, Hanns-Immo; Prag, Rudolf; and Schlichting, Heidi, to Siemens Aktiengesellschaft. Process and device for determining radioactive isotope. 3,790,786, Cl. 250-71.50s.
Friesen, Wilmer J.; and Hulet, Frank A., to Hartman, M. W., Manufacturing Company, Inc. Foundry mold jacket and weight shifter. 3,789,914, Cl. 164-339.000.
Fritze, Hans-Joachim F. G. Process for the production of corticated oat kernels and oat flakes. 3,790,690, Cl. 426-457.000.
Froimson, Avrum I. Therapeutic support device. 3,789,842, Cl. 128-165.000.
Frost, C. L., & Son Inc.: *See—*
Frost, Charles C.; and Weis, Siegfried K., 3,789,683.
Frost, Charles C.; and Weis, Siegfried K., to Frost, C. L., & Son Inc. Rotatable member assembly and method for making same. 3,789,683, Cl. 74-230.800.
Frost, John B.: *See—*
Callais, Richard T.; Eisenberg, Herbert; Forbes, F. Douglas; Kosco, Thomas J.; Taxin, Harry M.; and Frost, John B., 3,790,700.
Fry, Peter William, to Integrated Photomatrix Limited. Device for generating a high voltage supply. 3,790,812, Cl. 307-110.000.
Fuelling, Wolfgang; and Osenberger, Werner, to Bremshey AG. Rail guiding device for vehicle seats. 3,790,234, Cl. 308-6.00r.
Fuji Photo Film Co., Ltd.: *See—*
Hashiue, Masakazu; Yamashita, Hiroshi; and Sekikawa, Nobuyoshi, 3,790,376.
Fuji Photo Film Company, Ltd.: *See—*
Hayakawa, Yoshihide; and Satomura, Masato, 3,790,378.
Oishi, Yashushi; Yoshida, Yoshinobu; and Sano, Kazuya, 3,790,384.
Oishi, Yasushi; Sano, Kazuya; and Yoshida, Yoshinobu, 3,790,379.
Shiba, Keisoke; Hinata, Masanao; Yamasue, Koutarou; Sato, Akira; and Ikeda, Tadashi, 3,790,390.
Shiba, Keisuke; Sano, Kazuya; Okumura, Akio; and Kubodera, Seiiti, 3,790,388.
Shimamura, Isao; Okusut, Eiichi; Iijima, Yoo; and Iwano, Haruhiko, 3,790,383.
Fuji Shashin Film Kabushiki Kaisha: *See—*
Ueda, Hiroyuki; and Sawano, Yukio, 3,790,266.
Fuji Spinning Co., Ltd.: *See—*
Kodama, Mikio, 3,789,469.
Fujie, Shin: *See—*
Ichikawa, Katsumi; and Fujie, Shin, 3,790,956.

Fujimura, Ki.ji; and Tanaka, Katsutoshi, to Kabushiki Kaisha Kyoritsu. Process for producing cationic water soluble polymer by reacting formaldehyde, amine, a polymer of acrylamide or methacrylamide and precipitating said polymer with a water soluble salt f a polybasic acid. 3,790,529, Cl. 260-72.00r.

Fujitsu Limited: *See—*
Iizuka, Yoshio; and Morita, Tetsuro, 3,790,894.
Owaki, Kenichi; Kiyozumi, Kentaro; and Nakayama, Northiko, 3,789,470.

Fujiwara Manufacturing Company, Ltd.: *See—*
Uefuji, Zenichiro, 3,790,306.

Fukuda, Hide: *See—*
Saito, Yoshiomi; Sasaki, Hiroshi; Yamaguchi, Mamoru; Fukuda, Hide; Yamada, Humio; and Kimura, Koji, 3,790,524.

Fukuda, Hideo: *See—*
Ohishi, Tetsu; Fukushima, Hiroshi; and Fukuda, Hideo, 3,790,646.

Fukuda, Makoto: *See—*
Murayama, Naohiro; and Fukuda, Makoto, 3,790,645.

Fukui, Norihiro: *See—*
Kimura, Shinji; Fukui, Norihiro; and Nagai, Yasuhiro, 3,790,743.

Fukushima, Hiroshi: *See—*
Ohishi, Tetsu; Fukushima, Hiroshi; and Fukuda, Hideo, 3,790,646.

Fuller Company: *See—*
Cohen, Sidney M., 3,790,334.
Nix, Thomas B., 3,790,143.

Fulmer, Keith H., to Bendix Corporation, The. Brake proportioning valve with blend back. 3,790,221, Cl. 303-6.00c.

Fulwyler, Mack J., to United States of America, Atomic Energy Commission. Method for production of uniform microspheres. 3,790,492, Cl. 252-301.10r.

Funforms Inc.: *See—*
Ragnow, Richard W., 3,790,175.

Funkey, Donald J., to General Tire & Rubber Company, The. Hopper car hatch cover and lock assembly. 3,789,776, Cl. 105-377.000.

G & H Technology, Inc.: *See—*
Morgan, Thomas, 3,789,484.

Gadefelt, Goran R.: *See—*
Egerbork, Bo Malte S.; Gadefelt, Goran R.; Hagbjer, Gunnar Ingemar; and Spang, Kjett Knut I., 3,790,078.

GAF Corporation: *See—*
Kiss, Kornel D.; Mills, George S.; and Smolin, Edwin M., 3,790,647.

Gaffney, Arthur J. Impulse engine. 3,790,872, Cl. 318-139.000.

Gale, Charles, to Lilly, Eli, and Company. Synergistic tylosin and furazolidone medication for calf pneumoenteritis complex. 3,790,669, Cl. 424-120.000.

Galindo, Rudolph D.: *See—*
Miller, Jack V.; and Galindo, Rudolph D., 3,790,774.

Gallaiin, Norman W. Trapezoidal trailer hitch. 3,790,191, Cl. 280-456.000.

Gallay, Jean-Jacques, to Ciba-Geigy Corporation. 1,3-Benzodioxol-2-thiones, process of manufacture and method of use. 3,790,601, Cl. 260-340.500.

Gampe, Egon, to Rheinmetall G.m.b.H. Apparatus for gripping and separating respectively of a hose emerging from an extruder and for its feeding into a divisible blowing from by means of a blowing device for hollow bodies. 3,790,329, Cl. 425-387.00b.

Ganance, Charles G.: *See—*
Convertine, Frank J.; and Ganance, Charles G., 3,789,540.

Gandy, Gerald C.: *See—*
Barkey, Kenneth T.; Gandy, Gerald C.; and May, Douglas C., 3,790,653.

Gann, Donald S.: *See—*
Kopaniky, Dennis R.; and Gann, Donald S., 3,789,831.

Garanelo, Kirk T.: *See—*
Douglas, Lloyd A.; and Garanelo, Kirk T., 3,789,820.

Garceau, Harry A., to Webster Spring Co., Inc. Spring assembly. 3,789,440, Cl. 5-256.000.

Garcia, Joe N., to Yoakum, Marshall. Jump suit with adjustable trunk. 3,789,429, Cl. 2-79.000.

Gardner, David Stanley John; and Morrell, John Anthony, to White Tomkins, Limited. Bitter substances and their preparation. 3,790,686, Cl. 426-349.000.

Gardner, Delbert J.: *See—*
Tam, George M.; Gardner, Delbert J.; Grabe, Frederick G.; Putt, James B.; Owens, Carl D.; and Sisco, William C., 3,789,735.

Gardner, John A., Jr.; and Brown, Merle S., to Jet Spray Cooler, Inc. Hot liquid dispenser. 3,790,028, Cl. 222-129.400.

Garnache, Richard R.; Gratalia, Ashwin K.; and Michaud, Ronald A., to International Business Machines Corporation. Continuous vapor processing apparatus and method. 3,790,404, Cl. 117-106.00r.

Garrett Corporation, The: *See—*
McCormack, William H., 3,790,910.

Garrett, Henry U., to Brown Oil Tools, Inc. Method and apparatus for modifying a well to provide gas lift production. 3,789,923, Cl. 166-55.100.

Garrison, Mary M.; and Bates, Robert W., to United States of America, Health, Education, and Welfare. Dry antiserum coated solid-phase for preparation of radioimmunoassay of antigens. 3,790,663, Cl. 424-12.000.

Garte, Gilbert M. Folding hospital bed. 3,789,437, Cl. 5-62.000.

Gartner, Robert. Screw drive means using auxiliary meshing rollers. 3,789,678, Cl. 74-89.000.

Gastrock, William Henry: *See—*
Asato, Goro; Berkelhammer, Gerald; and Gastrock, William Henry, 3,790,589.

Gattuso, Marion J.; and Arnold, Robert J., to Universal Oil Products Company. Inhibiting PR evulcanization of rubber formulations. 3,790,534, Cl. 260-79.50b.

Gatzi, Karl: *See—*
Bader, Jorg; and Gatzi, Karl, 3,790,677.

Gaucheron, Jean Marie, to Thomson-CSF. Synchronizing device for a television scanning equipment. 3,790,710, Cl. 178-69.5dc.

Gavrilenko, Nikolai Pavlovich: *See—*
Brusakov, Jury Ivanovich; Sirotkin, Nikolai Nikolaevich; Kiselev, Vasily Pavlovich; Ilinkov, Dmitry Vladimirovich; Pavlovichavdely, Mikhail; Marin, Semen Pantelecevich; Shkarupa, Alexandr Ivanovich; Veisman, Boris Ottovich; Lebedev, Vladimir Nikolaevich; an Gavrilenko, Nikolai Pavlovich, 3,790,692.

Gaylord, Eber W., to Gulf Research & Development Company. Centrifugal cleaner. 3,789,984, Cl. 209-505.000.

Gealt, Arthur E., to Honeywell Inc. PH reference electrode. 3,790,463, Cl. 204-195.00f.

Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Brandenburg, Helmut, 3,789,795.

Gehrle, Robert Charles: *See—*
Heinz, Robert Alfred; and Gehrle, Robert Charles, 3,790,280.

Geiger, Rolf: *See—*
Konig, Wolfgang; and Geiger, Rolf, 3,790,618.

Geislinger, Eric L. Apparatus for programming movement of a cart. 3,789,939, Cl. 180-6.500.

Geller, Richard, to Commissariat a l'Energie Atomique. Method and device for producing by charge-transfer a beam of neutral particles or of ions having multiple charges. 3,790,787, Cl. 250-251.000.

General Datacomm Industries: *See—*
Davis, Steven J.; and Domyan, Stephen L., 3,789,803.

General Electric Company: *See—*
Bailey, Ronald B., 3,790,877.
Barron, Mark B.; and Butler, Walter J., 3,790,825.
Berger, Abe, 3,790,613.
Bolin, Larry R.; Hopper, Claude, Jr.; and Jolly, Shelby A., 3,790,852.
Cromer, George P., 3,790,408.
Dada, Abdul G.; Dehollander, William R.; and Sloat, Robert J., 3,790,493.
Datta, Ranasit K.; and Luscher, Thomas W., 3,790,490.
Filkorn, Robert L., 3,790,058.
Hendrickson, Robert L.; and Scheper, George W., Jr., 3,790,298.
Merrill, Duane F., 3,790,527.
Morong, William H., Jr., 3,790,888.
Oster, Lloyd Robert, 3,790,778.
Parker, Rollin James, 3,790,197.
Raleigh, William J., 3,790,612.
Ripley, Charles C., 3,789,476.
Smith, Russell M., 3,790,871.
Wilk, Stanley H., 3,789,774.
Wyland, Alvin D., 3,790,730.

General Foods Corporation: *See—*
Pitchon, Esra; and Earle, Ernest L., Jr., 3,790,689.
Tole, Ingvar L.; Herzing, Vernon J.; Miller, Everett L.; and Lightfoot, George L., 3,790,004.

General Kinematics Corporation: *See—*
Musschoot, Albert, 3,789,977.

General Mills Fun Group, Inc.: *See—*
Convertine, Frank J.; and Ganance, Charles G., 3,789,540.

General Motors Corporation: *See—*
Bailey, Keith A.; and Marlow, Jerry R., 3,789,963.
Ballou, Richard P., 3,790,199.
Benasutti, Louis D.; and Sucro, Jost S., 3,789,620.
Bonfiglio, Charles P., 3,790,830.
Borman, August H., 3,789,865.
Butts, Mervin R.; and Robbins, Joseph J., 3,790,311.
Cutter, Delbert M., 3,789,687.
Gillham, Ronald F.; and Wiers, Ward W., 3,789,814.
Heidorn, John H., 3,789,965.
Hyde, A. P. Stanley; and La Framboise, Leo F., 3,790,317.
Jenei, Joseph, 3,790,420.
Matier, Robert C.; and Paul, Leon F., 3,789,910.
Meyer, Carl L.; and Sayers, Eugene H., 3,790,866.
Moulds, John W., 3,789,819.
Owen, Robert E., 3,790,147.
Price, Robert T., 3,789,702.
Sattler, Walter J., 3,789,810.
Shellman, Carl E.; and Week, Nils P., 3,789,703.
Sihon, Tanas M., 3,789,743.
Smith, Oscar H., 3,789,909.
Warwick, Edward H., 3,789,961.
Whelan, James E., 3,790,310.
Williams, Richard H., 3,789,698.
Witten, Arthur L., 3,790,873.

General Steel Industries, Inc.: *See—*
Jackson, Keith L., 3,789,771.

General Tire & Rubber Company, The: *See—*
Funkey, Donald J., 3,789,776.

Georg, Werner, to Gewerkschaft Eisenhutte Westfalia. Mining installation. 3,790,210, Cl. 299-43.000.

George, Darell L., to Henry, J. W. Party keg beer dispenser apparatus. 3,790,032, Cl. 222-146.000.

Georgia-Pacific Corporation: *See*—
Malinowski, Edward Stephen, 3,790,066.

Gerber Garment Technology: *See*—
Gerber, Heinz Joseph; and Pearl, David R., 3,790,154.

Gerber Garment Technology, Inc.: *See*—
Pearl, David R., 3,789,716.

Gerber, Heinz Joseph; and Pearl, David R., to Gerber Garment Technology. Apparatus for holding sheet material and other objects during working. 3,790,154, Cl. 269-22.000.

Gerber, Wesley Duane: *See*—
White, Matthew B.; and Gerber, Wesley Duane, 3,790,901.

Gerdes, Paul E.: *See*—
Vollrath, Walter J., Jr.; Vollrath, Richard J.; Virnoche, Paul R.; Turk, Joseph; Gerdes, Paul E.; and Singer, Roy W., 3,789,434.

Gering, Kuido, to Granges-Essem AB. Device in a melting or holding furnace for facilitating the charging thereof. 3,790,145, Cl. 266-33.00r.

Germond, Jean-Claude; Glachet, Charles; and Guilbaud, Jean-Pierre, to Commissariat a l'Energie Atomique. Manipulator with drive motors. 3,790,002, Cl. 214-1.0cm.

Gerrish, Oliver B., Sr.: *See*—
Rao, Ganta V.; and Gerrish, Oliver B., Sr., 3,790,553.

Gerzon, Koert; Ryan, Charles W.; and De Long, Donald C., to Lilly, Eli, and Company. Method of virus suppression by hydantoins. 3,790,673, Cl. 424-273.000.

Gesellschaft fur Kernforschung mbH: *See*—
Hagen, Armin Theodoro, 3,790,198.

Getty, John A., Jr., to Dover Corporation. Seat for butterfly valves. 3,790,130, Cl. 251-306.000.

Getz, Gary R., to McNeil Corporation. Method for loading a tire shaping and curing press employing a center mechanism. 3,790,656, Cl. 264-315.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Georg, Werner, 3,790,210.

Giacobbe, Thomas J.: *See*—
Edamura, Fred Y.; and Giacobbe, Thomas J., 3,790,619.

Giacopelli, Umberto, to Solvay & Cie. Electrolytic cell including vertical hollow anodes with deflector panels diverging upwardly from each anode. 3,790,465, Cl. 204-266.000.

Giannini, Anthony J. Kitchen range with folding heater units. 3,790,750, Cl. 219-444.000.

Gibiani, Heinz; Kiesluch, Klaus; Koch, Hans-Joachim; Kosmol, Horst; Rufer, Clemens; Schroder, Eberhard; and Walsh, Rosemarie, nee Vossing, to Schering Aktiengesellschaft. Production of optically active antipodes. 3,790,445, Cl. 195-51.00r.

Gibs, Gabriel Joseph: *See*—
Remers, William Alan; Gibs, Gabriel Joseph; and Weiss, Martin Joseph, 3,790,590.

Giebler, Fritz, to Siemens Aktiengesellschaft. Circuit arrangement for the interruption-free switch-over from an operating current supply apparatus to a standby current supply apparatus. 3,790,822, Cl. 307-254.000.

Giesse, Roland: *See*—
Steppan, Hartmut; Uhlig, Fritz; and Giesse, Roland, 3,790,385.

Gilano, Michael N., to Dynachem Corporation. Electroless copper plating. 3,790,392, Cl. 106-1.000.

Giles, William H., to Van Buren Industries, Inc. Wrapping apparatus with rotary horizontal lift. 3,789,576, Cl. 53-234.000.

Gill, Peter John; and O'Donnell, Dennis Joseph, to GKN Screws & Fasteners Limited. Load-indicating means for a nut and bolt assembly. 3,789,726, Cl. 85-62.000.

Gilles, Horst: *See*—
Riedel, Rudolf; Zelder, Felix; and Gilles, Horst, 3,789,889.

Gillette Company, The: *See*—
Krochock, David Arthur; and Laiderman, Donald David, 3,790,664.

Gillette, Robert Paul. Pulverizer with satellite spacer assembly. 3,790,095, Cl. 241-103.000.

Gillham, Ronald F.; and Wiers, Ward W., to General Motors Corporation. Ambient temperature regulated choke. 3,789,814, Cl. 123-119.00f.

Gilliland, Michael L., to Ametek, Inc. Multi-function centrifugal blower unit. 3,790,300, Cl. 415-219.000.

Giotti, Alberto; and Sicuteri, Federigo. Method for activating blood fibrinolysis by administration of a salt of 2-amino-ethanesulphonic acid. 3,790,672, Cl. 424-248.000.

Girguis, Subhy Labib, to Uni-Cardan AG. Constant velocity universal joint. 3,789,626, Cl. 64-21.000.

Giroux, Davis W. Vibro hammer positioner. 3,789,932, Cl. 173-43.000.

Girten, William, to Scott, Joseph W. and Scott, Zephyr. Apparatus for the stimulation of blood circulation in feet and legs. 3,789,836, Cl. 128-25.00b.

GKN Screws & Fasteners Limited: *See*—
Gill, Peter John; and O'Donnell, Dennis Joseph, 3,789,726.

Glachet, Charles: *See*—
Germond, Jean-Claude; Glachet, Charles; and Guilbaud, Jean-Pierre, 3,790,002.

Glanzstoff AG: *See*—
Magerlein, Helmut; Meyer, Gerhard; and Rupp, Hans-Dieter, 3,790,627.

Glass, Marvin & Associates: *See*—
Morrison, Howard J., 3,789,546.

Glass, Max E.; Donahue, Stephen F.; and Carlson, Arthur, Jr., to Haver-Lockhart Laboratories, Inc. Injectable adjuvant, method of preparing same and compositions including such adjuvant. 3,790,665, Cl. 424-81.000.

Glassman, Donald: *See*—
Didycz, William J.; and Glassman, Donald, 3,790,448.

Glatzer, Stephen G.: *See*—
Laserson, Gregory L.; Feinman, Harvey; Stand, Mille; Glatzer, Stephen G.; and Scappatura, Rocco, 3,790,727.

Glaverbel S.A.: *See*—
Van Laethem, Robert; Baudin, Pol; and Hoyois, Jean-Claude, 3,790,748.

Glaxo Laboratories, Limited: *See*—
Kennedy, James; Long, Alan Gibson; and Underwood, William George Elphinstone, 3,790,567.

Globe-Union Inc.: *See*—
Orlando, Daniel, 3,790,741.

Glory Kogyo Kabushiki Kaisha: *See*—
Inoue, Komei; Yorisue, Kazumi; and Akamatsu, Mitsuhiro, 3,789,968.

Gobapur S.A.: *See*—
Jourquin, Lucien Edmond, 3,790,422.

Goetz, Lawrence R.: *See*—
Cook, Albert N.; Goetz, Lawrence R.; Manley, Paul A.; and Yelpo, Joseph P., 3,789,783.

Gold, Stephen J. Apparatus for measuring the flow velocity of fluid within a conduit. 3,789,663, Cl. 73-194.00c.

Goldstein, Irving; and Rambauske, Werner R., to Raytheon Company. Conductively cooled catoptric lens arrangement. 3,790,257, Cl. 350-294.000.

Golser, Hans, to Siemens Aktiengesellschaft. Gas laser mirror assembly. 3,790,900, Cl. 331-94.500.

Good, Thomas W.; and Zbikowski, Theodore H., to Tonka Corporation. Toy vehicle pumper. 3,789,541, Cl. 46-215.000.

Goodman, Brian L.; Higgins, Robert B.; and Denham, Frank M., to Ecodyne Corporation. Gas diffuser. 3,790,142, Cl. 261-124.000.

Goodrich, B. F., Company, The: *See*—
Ludwig, Robert, 3,790,520.
Minchak, Robert J., 3,790,545.
Shackelford, James R., 3,789,728.

Gorog, Istvan, to RCA Corporation. System for recording and playing back color encoded holograms. 3,790,701, Cl. 178-5.4cd.

Gorzegno, Walter P., to Foster Wheeler Corporation. Furnace circuit for variable pressure once-through generator. 3,789,806, Cl. 122-406.00p.

Gottlieb, Carl R.: *See*—
Fathauer, Jack E.; and Gottlieb, Carl R., 3,789,998.

Gould, Charles W.: *See*—
Wagner, Edgar R.; and Gould, Charles W., 3,790,512.

Gould, Hughjean Burton: *See*—
Drappeu, Robert E.; Gould, Hughjean Burton; and Maust, Daniel A., 3,789,454.

Grabe, Frederick G.: *See*—
Tam, George M.; Gardner, Delbert J.; Grabe, Frederick G.; Putt, James B.; Owens, Carl D.; and Sisco, William C., 3,789,735.

Graber, Homer R.: *See*—
Krehbiel, Robert D.; and Graber, Homer R., 3,789,739.

Grable, Donovan B., 99% to Wastland Reclamation Corporation, 0.5% to Laney, Bill C. and 0.5% to Haefliger, William W. Sub-surface particle recovery. 3,790,213, Cl. 299-8.000.

Grace, W. R., & Co.: *See*—
Eastes, Frank E., 3,790,402.

Graco Inc.: *See*—
Raleigh, Walter J., 3,789,954.

Graham, Andrew E., Jr.; and Sitler, Rickie L., to Armstrong Cork Company. Extruded cellular slab of varying densities. 3,790,436, Cl. 161-161.000.

Gramer, Gottfried; and Korn, Roland, to Siemens Aktiengesellschaft. Thermal degassing of the primary coolant of nuclear reactors. 3,789,577, Cl. 55-42.000.

Granberg, Gunnar: *See*—
Larker, Hans; Isaksson, Sven-Erik; Lindberg, Mats; and Granberg, Gunnar, 3,790,339.

Granges-Essem AB: *See*—
Gering, Kuido, 3,790,145.

Graser, Fritz; and Bock, Gustav, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. 0,14-Dichloropyranthrone. 3,790,603, Cl. 260-360.000.

Grassmann, Peter H.: *See*—
Mika, Norbert; Grassmann, Peter H.; and Reis, Wilhelm, 3,790,802.

Gratalia, Ashwin K.: *See*—
Garnache, Richard R.; Gratalia, Ashwin K.; and Michaud, Ronald A., 3,790,404.

Graves, Kenneth E.; Madsen, Kay; and Schmidt, Warren J., to FMC Corporation. Bar code reading circuitry. 3,790,756, Cl. 235-61.11e.

Gray Tool Company: *See*—
McGee, John K., 3,789,875.

Graybill, Paul J. Air rectifier apparatus with process. 3,789,582, Cl. 55-92.000.

Greaves, Bruce Bousfield, to Cumberland Engineering Company Limited, The. Electrolyzer including rotatable bipolar electrodes. 3,790,464, Cl. 204-212.000.

Green, Edgar E. Trailer hitch safety device. 3,790,192, Cl. 280-507.000.
Greenhalgh, Colin William: *See—*
Cheetham, Ian; Dunkerley, Kenneth; Greenhalgh, Colin William; and Phillips, Duncan Adrian Sidney, 3,790,604.
Greiner, Bernd: *See—*
Quietzsch, Gerhard; Greiner, Bernd; Hund, Helmut; Nottebohm, Harald; and Pelz, Lothar, 3,790,457.
Griffith, George L., to Commercial Solvents Corporation. Enclosure for explosive material. 3,789,760, Cl. 102-24.0hc.
Griffith-Hope Company: *See—*
Filipowicz, Edwin A., 3,790,023.
Griffiths, Derek Jenkins: *See—*
Laub, Joseph L.; and Griffiths, Derek Jenkins, 3,790,738.
Gritzan, Hans: *See—*
Dao, Wolfram; Langer, Paul; and Gritzan, Hans, 3,789,967.
Groom, Jack J.; and Kinzel, Gary L., to Columbia Gas System Service Corporation. Apparatus for sensing a curvature in a conduit. 3,789,511, Cl. 33-312.000.
Gros, Wilfred T. Plumb bob device with spool means for tethering lines. 3,789,512, Cl. 33-393.000.
Gross Cash Registers Limited: *See—*
Gross, Henry, 3,789,755.
Gross, Henry, to Gross Cash Registers Limited. Printing devices for calculating apparatus. 3,789,755, Cl. 101-95.000.
Groth, Hugh P.: *See—*
Berg, Donald P.; and Groth, Hugh P., 3,789,439.
Grove, Marvin H.; and Waters, Rodney A., to M & J Valve Company and M & J Development Company. Valve apparatus and method. 3,790,123, Cl. 251-31.000.
Grunert, Hellmuth, to Prameta Prazisionsmetall- und Kunststofferzungnisse G. Baumann & Co. Boring device for securing hinges and the like. 3,790,295, Cl. 408-103.000.
GTE Automatic Electric Laboratories, Incorporated: *See—*
Ennis, Thomas E., 3,790,813.
Hutchinson, Homer F., 3,790,856.
Keitel, Gerald A., 3,790,916.
Kuster, Karl H., 3,790,809.
GTE Laboratories, Incorporated: *See—*
Hillman, Allen F., Jr., 3,790,855.
Hillman, Allen F., Jr., 3,790,903.
Jaddam, Abdulmassih Y., 3,789,504.
GTE Sylvania, Incorporated: *See—*
Knoll, William C., 3,790,936.
Le Fevre, Paul Eshelman, 3,790,909.
Redman, James C.; and Trent, Lynn E., 3,790,762.
Guarantee Specialty Manufacturing Company: *See—*
Urbas, Ernest J., 3,790,203.
Gubala, Thomas J.; and Kraft, Wayne O., to Boeing Company, The. Automatic video contrast control circuit. 3,790,706, Cl. 178-7.100.
Gudmestad, Ragnar, to Artos Engineering Company. Method and apparatus for producing flexible fiber optical light conductors. 3,789,485, Cl. 29-203.00d.
Gudmundsen, Richard A.; and Rau, James E., to North American Rockwell Corporation. Selectively tunable gaseous laser. 3,790,898, Cl. 331-94.500.
Guertin, Robert W.: *See—*
Ostand, Paul R.; and Guertin, Robert W., 3,790,126.
Guest, Jack B.; and Guest, Kathleen E. J. Document sorting apparatus. 3,789,779, Cl. 108-101.000.
Guest, Kathleen E. J.: *See—*
Guest, Jack B.; and Guest, Kathleen E. J., 3,789,779.
Guichard, Louis. Infinitely variable-speed friction transmission. 3,789,699, Cl. 74-796.000.
Guilbaud, Jean-Pierre: *See—*
Germond, Jean-Claude; Glachet, Charles; and Guilbaud, Jean-Pierre, 3,790,002.
Guillemat, Jean: *See—*
Duhaut, Pierre; Guillemat, Jean; and Miquel, Jean, 3,790,504.
Gulf Research & Development Company: *See—*
Carr, Norman L.; and Stahlfeld, Donald L., 3,789,581.
Dahle, Norman A., 3,790,588.
Gaylord, Eber W., 3,789,984.
Gunja-Smith, Zeenat, to Research Corporation. Cytophaga isoamylase. 3,790,446, Cl. 195-66.00r.
Gurley, Derrel G.; and Crowe, Curtis W., to Dow Chemical Company, The. Treatment of gravel packed formations. 3,789,927, Cl. 166-282.000.
Gurski, Gary F.: *See—*
Buczek, Carl J.; Skolnick, Michael L.; and Gurski, Gary F., 3,790,278.
Gutman, Arnold D., to Stauffer Chemical Company. Oximinophosphonodithioates as insecticides and acaricides. 3,790,670, Cl. 424-210.000.
Haberle, Wilhelm. Apparatus for producing a thermoplastically deformable plastic foil. 3,790,327, Cl. 425-376.000.
Habgood, Robert P., Jr., to Plexowood, Inc. Composite articles and methods of making the same. 3,790,421, Cl. 156-242.000.
Haddock, Ernest: *See—*
Montijn, Paulus P.; and Haddock, Ernest, 3,790,614.
Hadley, Henry C., Jr.: *See—*
United States of America, National Aeronautics and Space Administration, 3,790,795.
Haefliger, William W.: *See—*
Grable, Donovan B., 3,790,213.
Haensel, Vladimir, to Universal Oil Products Company. Apparatus for catalytic conversion of fluids. 3,790,350, Cl. 23-288.00f.
Hafele, Frederick J.; and Smith, Hugh M., to Sun Chemical Corporation. Quinacridone pigments. 3,790,575, Cl. 260-279.00r.
Hagar, Donald K., to Mosser Industries, Incorporated. Butterfly valve. 3,790,131, Cl. 251-306.000.
Hagbjer, Gunnar Ingemar: *See—*
Egerbork, Bo Malte S.; Gadefelt, Goran R.; Hagbjer, Gunnar Ingemar; and Spang, Kjett Knut I., 3,790,078.
Hagen, Armin Theodoro, to Gesellschaft fur Kernforschung mbH. Self-locking safety seal and method of identifying tampering therewith. 3,790,198, Cl. 292-317.000.
Hagen, Elmer Ray. Method and apparatus for removing wrinkles from slacks, or the like. 3,790,043, Cl. 223-61.000.
Halbert, Silas Ray. Picking and transporting apparatus and method. 3,790,162, Cl. 271-118.000.
Haldeman, Charles W., to Megutech Corporation. Electromechanical dynamometer system. 3,789,659, Cl. 73-134.000.
Hale, Elden A., to Koppers Company, Inc. Self-adjusting sealing apparatus. 3,789,879, Cl. 137-614.110.
Haley, John S.; Cooper, Jerry W.; and Logan, Arthur D., to Dayco Corporation. Polyvinyl alcohol fiber reinforced polyurethane compositions and products therefrom. 3,790,437, Cl. 161-170.000.
Hall, John, to Dowty Boulton Paul Limited. Multiple hydraulic actuator. 3,789,736, Cl. 91-3.000.
Hallberg, Daniel P., to FMC Corporation. Hydrostatic bearing for radial piston pump. 3,789,741, Cl. 91-488.000.
Hambock, Heinz: *See—*
Traber, Walter; Hambock, Heinz; and Weiss, Anton George, 3,790,615.
Hamilton, Georges Edmond; and Hamilton, William Horace. Golf ball ejector and flag post for putting cups. 3,790,166, Cl. 273-34.00a.
Hamilton, Jack L.; Jenks, John W.; and Milberger, John F., to United States Steel Corporation. Method of surface-conditioning heat-treating-furnace hearth rolls having sleeves of rebonded fused silica thereon by processing silicon steel strip. 3,789,647, C. 72-236.000.
Hamilton, William Horace: *See—*
Hamilton, Georges Edmond; and Hamilton, William Horace, 3,790,166.
Hanaoka, Satoshi: *See—*
Kurosaki, Teikichi; Odaka, Munehiko; and Hanaoka, Satoshi, 3,790,640.
Hanes, Roger A. Foot operated piano playing device. 3,789,722, Cl. 84-426.000.
Haneshige Tenter Clip Co., Ltd.: *See—*
Takasaki, Shigeaki, 3,789,468.
Hanna, Elias G.: *See—*
Scraeder, Charles R.; Rea, Samuel N.; Tao, Yung; and Hanna, Elias G., 3,790,859.
Hannan, William James; and Frattarola, Joseph Ralph, to RCA Corporation. Double-sided holographic replicas. 3,790,245, Cl. 350-3.500.
Hannley, Ray John: *See—*
Montague, Bernard R.; Leyburn, Derek; Barker, John; Hannley, Ray John; Leblanc, Vincent G.; and Tam, Leslie K., 3,790,719.
Hansen, Kenneth N., to Allis-Chalmers Corporation. Vehicle control module support. 3,789,945, Cl. 180-69.00r.
Hanyo, Susomo; and Kasuga, Noboru. Sewing machine. 3,789,784, Cl. 112-246.000.
Harkness, Leslie, to Warner Swasey Asquith Limited. Method and apparatus for setting cutting tools in machine tools. 3,789,509, Cl. 38-185.00r.
Harman, James F.: *See—*
Beck, Roderick; Harman, James F.; Shatila, Mounir A.; Richins, David A.; and Lack, John, 3,789,750.
Hartman, Elmer C., III, to Hartman Metal Fabricators, Inc. Position control system for warehouse apparatus. 3,790,006, Cl. 214-16.40a.
Hartman, M. W., Manufacturing Company, Inc.: *See—*
Friesen, Wilmer J.; and Hulet, Frank A., 3,789,914.
Hartman Metal Fabricators, Inc.: *See—*
Hartman, Elmer C., III, 3,790,006.
Smith, Harry E., 3,790,005.
Harvey, Ronald William S. Raised flooring. 3,789,557, Cl. 52-126.000.
Hasada, Yoshiyasu; and Yasue, Teruo, to Kurashiki Rayon Co., Ltd. Process for preparation of organic dinitriles. 3,790,617, Cl. 260-465.80d.
Hasebe, Sukehiro, to Kabushiki Kaisha Kapau. Synchronous motor. 3,790,833, Cl. 310-162.000.
Hashimoto, Kametaro: *See—*
Nagoya, Itaru Niimi; Hashimoto, Kametaro; Ushitani, Kenzi; Serino, Yoichi; Mitani, Seishu; and Imanishi, Kunizo, 3,790,352.
Niimi, Itaru; Hashimoto, Kametaro; Ushitani, Kenzi; Serino, Yoichi; Ishihara, Ko; Mitani, Seishu; and Imanishi, Kunizo, 3,790,351.
Hashimoto, Yoshio. Bowler's wrist support. 3,790,168, Cl. 273-54.00b.
Hashiue, Masakazu; Yamashita, Hiroshi; and Sekikawa, Nobuyoshi, to Fuji Photo Film Co., Ltd. Electron beam recording material. 3,790,376, Cl. 96-27.000.
Hashizume, Taeko: *See—*
Irikura, Tsutomu; Kasuga, Kazunori; Hashizume, Taeko; Ohasi, Mitsuo; Yuge, Masuo; and Yamada, Michiko, 3,790,586.
Hasson, Harrith M. Vaginal radium applicator. 3,789,829, Cl. 128-1.200.

Hastwell, Peter John: *See—*
Smith, Ian Edward; Hastwell, Peter John; and Vermeulen, Marinus Cornelius, 3,789,794.

Hatzmann, John F.; and Miller, Donald P., to Xerox Corporation. Automatic document handling device. 3,790,159, Cl. 271-4.000.

Hauber, Ferdinand R., to Brown & Rost, Inc. Method for handling a barge for transferring large heavy cargo modules. 3,790,009, Cl. 214-152.000.

Hauni-Werke Korber & Co., KG: *See—*
Wahle, Gunter, 3,789,744.

Haupt, Robert C., to Allis-Chalmers Corporation. Friction block for lever. 3,789,694, Cl. 74-531.000.

Hausler, Rudolf H., to Universal Oil Products Company. Alkylene polyamine and polymeric reaction product corrosion inhibitor. 3,790,496, Cl. 252-392.000.

Haver-Lockhart Laboratories, Inc.: *See—*
Glass, Max E.; Donahue, Stephen F.; and Carlson, Arthur, Jr., 3,790,665.

Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Light-intensifying device. 3,790,867, Cl. 317-234.00r.

Hayakawa, Yoshihide; and Satomura, Masato, to Fuji Photo Film Company, Ltd. Process for the formation of polymer images. 3,790,378, Cl. 96-48.00r.

Hayakawa, Yoshihiro: *See—*
Onishi, Akira; Irako, Koichi; Hayakawa, Yoshihiro; Shimomura, Takeshi; Kawagoi, Takahiro; and Miyamoto, Shoji, 3,790,539.

Hayman, William J.: *See—*
Way, Allan S.; and Hayman, William J., 3,790,283.

Hayssen Manufacturing Company: *See—*
James, Robert C.; Wilson, David A.; and Pringle, Frank E., Jr., 3,789,888.

Hebert, Marcel: *See—*
Doittau, Francois-Xavier; Ythier, Jean-Pierre; and Hebert, Marcel, 3,790,890.

Heenan, Sidney A.; and Majewski, Norbert, to Amerace Esna Corporation. Pavement marker reflector member and assembly. 3,790,293, Cl. 404-15.000.

Heian, Glenn A., to Allis-Chalmers Manufacturing Company. Rotatable material handling drum. 3,790,323, Cl. 425-222.000.

Heidorn, John H., to General Motors Corporation. Vacuum clutch actuator. 3,789,965, Cl. 192-85.00v.

Heier, Wilbur C., to United States of America, National Aeronautics and Space Administration. Method for compression molding of thermosetting plastics utilizing a temperature gradient across the plastic to cure the article. 3,790,650, Cl. 264-102.000.

Heimann, Arnold: *See—*
Mottu, Andre; and Heimann, Arnold, 3,790,296.

Heimsch, Robert A.; and Reaville, Eric T., to Monsanto Company. Photoxidizable compositions. 3,790,389, Cl. 96-115.00r.

Heinrich, Frank-Armin, to Bosch, Robert, Photokins GmbH. Movie camera release control circuit with voltage stabilization. 3,790,264, Cl. 352-174.000.

Heinz, Robert Alfred; and Gehrle, Robert Charles, to Western Electric Company, Incorporated. Spatial filtering system utilizing compensating elements. 3,790,280, Cl. 356-71.000.

Heisner, Mark. Prefabricated swimming pool. 3,789,435, Cl. 4-172.190.

Helm, Herbert W., to Smithe, F. L., Machine Company, Inc. Device for maintaining uninterrupted feeding of blanks from the bottom of a stack. 3,790,163, Cl. 271-165.000.

Helmcke, Conrad D.; and Wendt, Hans J., to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Method and means for varying the speeds of vehicles moving along a track. 3,790,780, Cl. 246-187.00c.

Helmes, Alfred, to Rheinmetall G.m.b.H. Automatic weapon with self locking bolt breech block. 3,789,730, Cl. 89-183.000.

Hempelmann, Wilhelm; Waldenmeier, Gunter; and Kienhofer, Manfred, to Argus Gesellschaft mbH. Device for transferring fluids. 3,790,128, Cl. 251-148.000.

Henderson, Ian H. S.; and Ladan, Stephan George, to Minister of National Defence, Her Majesty the queen in right of Canada as represented by the. Electrodeposition of sponge nickel. 3,790,454, Cl. 204-49.000.

Hendricks, John E., to Industrial Electronics Engineers, Inc. Bar segment readout unit. 3,790,946, Cl. 340-336.000.

Hendrickson, Robert L.; and Scheper, George W., Jr., to General Electric Company. Flexible contour turbine nozzle for tight closure. 3,790,298, Cl. 415-152.000.

Heneveld, Lloyd A.; trustee of Dauser Trust IV: *See—*
Dauser, William C., 3,790,918.

Henley, Ronald W.; and Taliaferro, William D. Two stage cementing collar. 3,789,926, Cl. 166-224.00r.

Henry, J. W.: *See—*
George, Darell L., 3,790,032.

Herbenar, Edward J., to TRW Inc. Socket joint. 3,790,195, Cl. 403-124.000.

Herbert, Michael B., to American Standard, Inc. Knockdown framing. 3,789,561, Cl. 52-456.000.

Hercules, Incorporated: *See—*
Dehm, Henry C., 3,790,416.
Tillson, Henry C., 3,790,506.

Hermes Company: *See—*
Levine, Jack W., 3,789,732.

Herry, Michel Jean; and Lejay, Augustin, said Lejay assor. to International Standard Electric Corporation. Synchronization circuit for a pcm-tdm exchange. 3,790,716, Cl. 179-15.0bs.

Herschler, Robert J.; and Jacob, Stanley W., to Crown Zellerbach Corporation, mesne. Ataractic use of dimethyl sulfoxide. 3,790,682, Cl. 424-337.000.

Hersey Products, Inc.: *See—*
Hills, David A., 3,789,874.

Hershman, Gordon L.; and Schwerdtfeger, Wilbur E., to International Harvester Company. Hydraulic cylinder latch. 3,789,742, Cl. 92-26.000.

Hery, Jean-Francois. Protective mattress. 3,789,438, Cl. 5-91.000.

Herzing, Vernon J.: *See—*
Tole, Ingvar L.; Herzing, Vernon J.; Miller, Everett L.; and Lightfoot, George L., 3,790,004.

Hetteen, Edgar E., to Arctic Enterprises, Inc. Automatic shut-off switch. 3,789,938, Cl. 180-5.00r.

Hewlett-Packard Company: *See—*
Baldwin, Richard R., 3,790,284.
Soshea, Richard W., 3,790,868.

Heyer-Schulte Corporation: *See—*
Schulte, Rudolf R., 3,789,828.

Heyn, William O.; and Peisker, Glenn W., to Chicago Rawhide Manufacturing Company. Fluid seal with pumping action. 3,790,180, Cl. 277-134.000.

Heyner, Gero: *See—*
Wasel-Nielen, Horst Dieter; and Heyner, Gero, 3,790,661.

Heynick, Louis N.: *See—*
Spindt, Charles A.; Shoulders, Kenneth R.; and Heynick, Louis N., 3,789,471.

Heywang, Walter, to Siemens Aktiengesellschaft. Device for registering the instantaneous contact pressure of a probe and for the electronic recording of the instantaneous location of a probe on the surface of a plate. 3,790,709, Cl. 178-18.000.

Higgins, Robert B.: *See—*
Goodman, Brian L.; Higgins, Robert B.; and Denham, Frank M., 3,790,142.

High Precision Incorporated: *See—*
Ayer, Lloyd M., 3,790,085.

Highway Equipment Company: *See—*
Lorenc, Allan L.; and Blumer, John E., 3,790,090.

Hill, William E., to United States of America, Army, mesne. Propulsion method using 1-isopropenyl-2-ferrocenoyl-carborane burning rate catalyst. 3,789,609, Cl. 60-219.000.

Hill-Rockford Co.: *See—*
Stenger, Donald R., 3,789,478.

Hillman, Allen F., Jr., to GTE Laboratories, Incorporated. Electronic control module for anti-skid braking systems. 3,790,855, Cl. 317-5.000.

Hillman, Allen F., Jr., to GTE Laboratories, Incorporated. Transistor multivibrator switchable between two ratios of off/on pulse times. 3,790,903, Cl. 331-113.00r.

Hills, David A., to Hersey Products, Inc. Changing bias check valve. 3,789,874, Cl. 137-527.000.

Hinata, Masanao: *See—*
Shiba, Keisoke; Hinata, Masanao; Yamasue, Koutarou; Sato, Akira; and Ikeda, Tadashi, 3,790,390.

Hintz, Harald, to U.S. Philips Corporation. Arrangement provided with an electronic flash bulb. 3,790,847, Cl. 315-151.000.

Hiraoka, Michio: *See—*
Tesaki, Kiyoshi; and Hiraoka, Michio, 3,790,528.

Hirata, Arthur Atsunobu; and Boley, William Franklin, to Abbott Laboratories. Streptoccocci diagnostic method. 3,790,447, Cl. 195-103.50r.

Hitachi, Ltd.: *See—*
Inoue, Minoru; Ishimatsu, Kenji; and Tabuchi, Hideho, 3,790,782.
Masai, Tadahisa, 3,790,086.
Nishida, Sumio; and Kosa, Yasunobu, 3,789,503.

Hobart Manufacturing Company, The: *See—*
Katterheinrich, Fred H.; and Fox, Gerald B., 3,789,860.

Hobart, William M.; and Wainio, Allan C., to Honeywell Information Systems, Inc. Magnetic tape tip cutter. 3,790,325, Cl. 425-299.000.

Hobbs, Howard Frederick. Torque converters. 3,789,697, Cl. 74-677.000.

Hoch, Geraldine M.: *See—*
Wanamaker, John L.; Weber, Kenneth E.; and Hoch, Geraldine M., 3,790,453.

Hodder, David T.: *See—*
United States of America, National Aeronautics and Space Administration, 3,790,347.

Hodosh, Milton, to Research Corporation. Plastic bone composition. 3,790,507, Cl. 260-2.50r.

Hoesch Werke AG, mesne: *See—*
Hoffmann, Hans-Juergen; Lochr, Manfred; and Pfannkuche, Hubert, 3,790,146.

Hoesch Werke Aktiengesellschaft: *See—*
Kaiser, Theodor, 3,790,235.

Hoff, Dale R.: *See—*
Carlson, John A.; Hoff, Dale R.; and Rooney, Clarence S., 3,790,592.
Carlson, John A.; Hoff, Dale R.; and Rooney, Clarence S., 3,790,593.

Hoffmann, Hans-Juergen; Loehr, Manfred; and Pfannkuche, Hubert, to Hoesch Werke AG, mesne. Fluid filled supporting leg. 3,790,146, Cl. 267e64.00r.

Hoffmann-La Roche Inc.: *See—*
Albrecht, Harry Allen; and Plati, John Thomas, 3,790,591.
Brossi, Arnold; Focella, Antonino; and Teitel, Sidney, 3,790,636.
Edenhofer, Albrecht; and Spiegelberg, Hans, 3,790,583.
Tschirky, Hansjorg, 3,789,572.

Hogan, William M., to Blount & George, Inc. Optical instrument tracking system. 3,790,277, Cl. 356-152.000.

Hogendyk, Warren. Textile folding machine. 3,790,156, Cl. 270-30.000.

Hohenberg, Rudolph, to Avco Corporation. Infrared measurement of the turbine inlet temperature of a gas turbine engine. 3,789,665, Cl. 73-343.00p.

Hohne, Reinhard: *See—*
Storp, Klaus; and Hohne, Reinhard, 3,790,659.

Holland, Raymond Prunty, Jr. Kites. 3,790,112, Cl. 244-153.00r.

Holstetter, Pranz: *See—*
Mohlbauer, Heinz; and Holstetter, Pranz, 3,790,721.

Holz, George E.: *See—*
Doane, John C.; Holz, George E.; Ogle, James A.; and Samlyody, Arpod, 3,790,850.

Holz, William G. Crown-shaped pulley lagging. 3,789,682, Cl. 74-230.700.

Hommer, Gordon H., to Sun Oil Company of Pennsylvania, mesne. Lithium base lubricating grease method. 3,790,479, Cl. 252-41.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Aratani, Norio; and Nakano, Masaki, 3,789,467.
Kawaguchi, Takeski, 3,789,959.

Honeywell Inc.: *See—*
Baring, John A., 3,790,851.
Burton, Robert V., 3,789,940.
Gealt, Arthur E., 3,790,463.
Linner, Leslie Richard, 3,790,800.

Honeywell Information Systems, Inc.: *See—*
Deyesso, Joseph P.; and Palombo, Gaston A., 3,789,971.
Hobart, William M.; and Wainio, Allan C., 3,790,325.

Honjyo, Michitaro. Circumcision instrument. 3,789,848, Cl. 128-305.000.

Honkasalo, Jorma B.: *See—*
Bryk, Petri B.; Honkasalo, Jorma B.; Malmstron, Rolf E.; Makipirtti, Simo A. I.; Toivanen, Toivo A.; and Aaltonen, Olavi A., 3,790,366.

Honnold, Fred V., Jr.: *See—*
Italiano, Frank; Tobin, Curtis L.; Martin, William C., Jr.; and Honnold, Fred V., Jr., 3,790,114.

Hopfner, Clemens; and Ort, Wolfgang, to Eastman Kodak Company. Image changing device for slide projectors. 3,790,268, Cl. 353-111.000.

Hopper, Claude, Jr.: *See—*
Bolin, Larry R.; Hopper, Claude, Jr.; and Jolly, Shelby A., 3,790,852.

Horie, Fumio. Gum eraser. 3,790,511, Cl. 260-500.000.

Horl, Erwin; Scholze, Peter; and Mugschl, Eduard, to Oesterreichische Studiengesellschaft fur Alomenergie Gesellschaft m.b.H. Cathodoluminescence device for scanning electron microscopes. 3,790,781, Cl. 250-310.000.

Horner, Richard P., to Bendix Corporation, The. Extensible piston. 3,789,738, Cl. 91-168.000.

Horvath, William, to Thiokol Chemical Corporation. Rechargeable sprayer. 3,790,034, Cl. 222-153.000.

Hose, John M.: *See—*
Murray, Lowell C.; and Hose, John M., 3,790,019.

Hoshi Denki Seizo Kabushiki Kaisha: *See—*
Ojima, Shin; and Sano, Hiroshi, 3,790,711.

Hostetter, Joseph A., to Xerox Corporation. Photometer including variable amplification and dark current compensation. 3,790,288, Cl. 356-226.000.

Hough, David S. Double lock electric plug. 3,790,914, Cl. 339-14.00p.

Houlihan, William J., to Sandoz Wander, Inc. 2-Hydroxyalkyl-4,5-dihydropyridazin-3(2H)-one derivatives. 3,790,572, Cl. 260-250.00a.

Houtz, Kenneth E.: *See—*
Kampert, Keith W.; and Houtz, Kenneth E., 3,789,943.

Howard, Robert; and Robinson, Prentice I., to Centronics Data Computer Corporation. High speed printer. 3,789,969, Cl. 197-1.00r.

Hoyois, Jean-Claude: *See—*
Van Laethem, Robert; Baudin, Pol; and Hoyois, Jean-Claude, 3,790,748.

Hrebicek, James. Motor speed actuated vehicle bumper. 3,789,948, Cl. 180-91.000.

Hrivnyak, John. Spare tire and wheel carrier. 3,790,012, Cl. 214-454.000.

Hruschak, Joseph P.; and Ellis, George R., to Xerox Corporation. Data communication terminal. 3,790,958, Cl. 340-172.500.

Hubbell, Harvey, Incorporated: *See—*
Lee, Sung Chuel; and Muchnick, Paul, 3,790,857.

Huber, Ferdinand V., to Ecodyne Corporation. Steam condenser construction. 3,789,919, Cl. 165-101.000.

Huber, J. M., Corporation: *See—*
Fitton, Robert C., 3,790,396.

Huboi, Robert W.; Palmer, Osmond F.; and Waz, Edward M., to Eastman Kodak Company. Method and apparatus for sensing radiation derived from information bearing media. 3,790,275, Cl. 355-68.000.

Hudson, Jimmie E.; and Snelson, Jimmy W., to Phillips Petroleum Company. Textured fingers for precise temperature adjustment of preheated Parison preforms. 3,790,319, Cl. 425-387.00b.

Huey, Cecil O., Jr.: *See—*
Bradbury, Douglas W.; and Huey, Cecil O., Jr., 3,789,552.

Hughes Aircraft Company: *See—*
Burns, Richard W., 3,790,908.
Callais, Richard T.; Eisenberg, Herbert; Forbes, F. Douglas; Kosco, Thomas J.; Taxin, Harry M.; and Frost, John B., 3,790,700.
McKee, William E.; and Kaspaul, Erika E., 3,790,380.

Hughes, Fred: *See—*
Earl, Christopher B.; and Hughes, Fred, 3,790,660.

Hulet, Frank A.: *See—*
Friesen, Wilmer J.; and Hulet, Frank A., 3,789,914.

Hulley, Hubert E.: *See—*
Anderson, Richard W.; Weiss, Bernard J.; and Hulley, Hubert E., 3,790,938.

Humphreys, Donald R.: *See—*
Norris, John F.; and Humphreys, Donald R., 3,789,551.

Hund, Helmut: *See—*
Quietzsch, Gerhard; Greiner, Bernd; Hund, Helmut; Nottebohm, Harald; and Pelz, Lothar, 3,790,457.

Hung, Ya-Mei; and Liu, Yen-Ping Hsiao. Useful writing instrument. 3,790,291, Cl. 401-57.000.

Hunt, David O., to Lee Corporation. Radioactivity monitoring apparatus for fluids in flow. 3,790,804, Cl. 250-506.000.

Hunt, Duane A., to Matthews, Donnell R., Jr. Fuel mixture control. 3,789,813, Cl. 123-119.00f.

Huntt, Robert L. Method of making a multi-core magnetic head with a non-magnetic holder. 3,789,505, Cl. 29-603.000.

Hurt, Zeno, to Agon Uhrenfabrik Robert Triebold AG. Digital watch. 3,789,604, Cl. 58-59.000.

Hurwitz, Paul D. Vehicle conveyor. 3,789,766, Cl. 104-172.00b.

Hutchinson, Homer F., to GTE Automatic Electric Laboratories, Incorporated. Overvoltage protection circuit for dual outputs of opposite polarity. 3,790,856, Cl. 317-16.000.

Huvey, Michel; and Le Meur, Germain, to Institut Francais du Petrole, des Carburants et Lubrifiants and Soceite Anonyme pour Tous Apparcielages Mecaniques S.A. Process for making a tight coating around a pipe for conveying hydrocarbons and the resulting hyrocarbon conveying pipe line. 3,790,418, Cl. 156-79.000.

Hyde, A. P. Stanley; and La Framboise, Leo F., to General Motors Corporation. Vane assembly. 3,790,317, Cl. 418-137.000.

Hydro Conduit Corporation: *See—*
Breitfuss, Thomas K., 3,789,886.

Hydro-Mite Limited: *See—*
Smith, John Cambridge, 3,789,627.

Hyford, Derek Clark: *See—*
Rudston, Stanley George; Hyford, Derek Clark; and Blanchard, Peter Michael, 3,790,478.

Ichikawa, Katsumi; and Fujie, Shin, to Matsushita Electric Industrial Co., Ltd. Arrangement for presetting a television tuner. 3,790,956, Cl. 340-148.000.

Ida, Saburo; and Tobita, Kuniharu, to Kabushiki Kaisha Oji Yuksgoseishi Kenkyujo. Device for use in tenter type stretcher for preventing the torn-off edge of film from running off the normal path. 3,789,975, Cl. 198-180.000.

Ideal Toy Corporation: *See—*
Cagen, George, 3,789,539.
Thorn, Herbert, 3,789,544.

Igarashi, Kazuo: *See—*
Sakai, Hiroshi; Igarashi, Kazuo; Yamamoto, Takuji; and Matsuo, Normichi, 3,790,406.

Iijima, Yoo: *See—*
Shimamura, Isao; Okusut, Eiichi; Iijima, Yoo; and Iwano, Haruhiko, 3,790,383.

Iizuka, Yoshio; and Morita, Tetsuro, to Fujitsu Limited. Binary shaping circuit. 3,790,894, Cl. 328-164.000.

Ikeda, Seijiro. Method for bleaching fibrous materials and compositions therefor. 3,790,343, Cl. 8-108.000.

Ikeda, Shinichi; and Taguchi, Toshio, to Shiseido Co., Ltd. Stick type cosmetic applicator. 3,789,857, Cl. 132-88.700.

Ikeda, Tadashi: *See—*
Shiba, Keisoke; Hinata, Masanao; Yamasue, Koutarou; Sato, Akira; and Ikeda, Tadashi, 3,790,390.

Ilinkov, Dmitry Vladimirovich: *See—*
Brusakov, Jury Ivanovich; Sirotkin, Nikolai Nikolaevich; Kiselev, Vasily Pavlovich; Ilinkov, Dmitry Vladimirovich; Pavlovichavdely, Mikhail; Marin, Semen Panteleevich; Shkarupa, Alexandr Ivanovich; Veisman, Boris Ottovich; Lebedev, Vladimir Nikolaevich; an Gavrilenko, Nikolai Pavlovich, 3,790,692.

Imada, Katsumi: *See—*
Oga, Shunichiro; Sato, Kiyoshi; Imada, Katsumi; and Asano, Kazuo, 3,790,444.

Imamura, Harry H. Safety container and cap. 3,790,015, Cl. 215-9.000.

Imanishi, Kunizo: *See—*
Nagoya, Itaru Niimi; Hashimoto, Kametaro; Ushitani, Kenzi; Serino, Yoichi; Mitani, Seishu; and Imanishi, Kunizo, 3,790,352.

Niimi, Itaru; Hashimoto, Kametaro; Ushitani, Kenzi; Serino, Yoichi; Ishihara, Ko; Mitani, Seishu; and Imanishi, Kunizo, 3,790,351.
Impact Registers, Inc.: *See—*
O'Neill, Richard J.; Blaker, Gene M.; Manthei, Edward C.; and Ronk, Elmer L., 3,790,951.
Imperial Chemical Industries Limited: *See—*
Cheetham, Ian; Dunkerley, Kenneth; Greenhalgh, Colin William; and Phillips, Duncan Adrian Sidney, 3,790,604.
Colchester, John Edward; and Blundell, Thomas, 3,790,585.
Flannigan, William Tait, 3,790,510.
Mansfield, Geoffrey Harry; and Lyth, William, 3,790,345.
Robinson, Graham Ernest, 3,790,632.
Shearing, Herbert Jackson, 3,790,518.
Waring, Wilson Shaw, 3,790,577.
Indak Manufacturing Corporation: *See—*
Raab, Andrew F.; and Schaad, William J., 3,790,734.
Industrial Acoustics Company, Inc.: *See—*
Wasserman, Seymour; Cirulli, Albert; and Farrar, Edward A., 3,789,747.
Industrial Electronics Engineers, Inc.: *See—*
Hendricks, John E., 3,790,946.
Industrie Pirelli Societa per Azioni: *See—*
Portinari, Antonio, 3,790,694.
Infra Systems, Inc.: *See—*
Brunton, Donald C.; and Soltesz, Carl R., 3,790,796.
Ingalls, Edgar J. Crawfish peeler. 3,789,460, Cl. 17-73.000.
Inose, Hiroshi; Masuko, Yutaka; and Saito, Tadao, to Bell Telephone Laboratories, Incorporated. Digital transmission terminal for voice and low speed data. 3,790,715, Cl. 179-15.0bv.
Inoue, Komei; Yorisue, Kazumi; and Akamatsu, Mitsuhiro, to Glory Kogyo Kabushiki Kaisha. Control system of a coin-operated locker. 3,789,968, Cl. 194-1.00n.
Inoue, Minoru; Ishimatsu, Kenji; and Tabuchi, Hideho, to Hitachi, Ltd. Topographic radioisotope camera having an adjustable callimator thereon. 3,790,782, Cl. 250-361.000.
Institut Elektrosvarki Im. E. O. Patona: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georievich, 3,790,691.
Institut Francais du Petrole des Carburants et Lubrifiants: *See—*
Duhaut, Pierre; Guillemat, Jean; and Miquel, Jean, 3,790,504.
Huvey, Michel; and Le Meur, Germain, 3,790,418.
Institutul Politehnic Iasi: *See—*
Leonte, Constantin, 3,790,657.
Instrumentation Laboratory, Inc.: *See—*
Zettler, John F.; and Lazar, Walter A., 3,789,662.
Integrated Photomatrix Limited: *See—*
Fry, Peter William, 3,790,812.
International Business Machines Corporation: *See—*
Devore, Ernest W.; and Irwin, John W., 3,790,954.
Garnache, Richard R.; Gratalia, Ashwin K.; and Michaud, Ronald A., 3,790,404.
James, Randell Leland, 3,790,885.
Merten, Ronald A.; and Pickart, Don E., 3,790,407.
Tsui, Frank; and Tsui, Katherine, 3,790,841.
International Harvester Company: *See—*
Hershman, Gordon L.; and Schwerdtfeger, Wilbur E., 3,789,742.
Kampert, Keith W.; and Houtz, Kenneth E., 3,789,943.
Kowalik, John J., 3,789,942.
International Paper Company: *See—*
MacDonald, Donald M., 3,790,561.
Prappier, Robert H.; Tanner, Hal W., Jr.; and Wagers William O., 3,790,399.
International Playtex Corporation: *See—*
Fitzpatrick, William E.; and Cubitt, Robert D., 3,790,017.
International Standard Electric Corporation: *See—*
Herry, Michel Jean; and Lejay, Augustin (said Lejay assor. to), 3,790,716.
Ziegler, Reinhold, 3,790,769.
International Telephone and Telegraph Corporation: *See—*
Brancaleone, Salvatore T.; and Oliver, Leland W., 3,790,858.
Nevin, C. Scott, 3,790,844.
Stewart, Edward F., 3,790,723.
Weinstein, Richard, 3,790,122.
Inuzuka, Keizo, to A. P. Engineering Kabushiki Kaisha. Air conditioning apparatus. 3,789,621, Cl. 62-324.000.
Iplex Plastic Industries Pty., Ltd.: *See—*
Menzel, Otto C., 3,789,868.
I.R.A., Incorporated: *See—*
Rowell, Byron G., 3,789,878.
Irako, Koichi: *See—*
Onishi, Akira; Irako, Koichi; Hayakawa, Yoshihiro; Shimomura, Takeshi; Kawagoi, Takahiro; and Miyamoto, Shoji, 3,790,539.
Irikura, Tsutomu; Kasuga, Kazunori; Hashizume, Taeko; Ohasi, Mitsuo; Yuge, Masuo; and Yamada, Michiko, to Kyorin Seiyaku Kabushiki Kaisha. Imidazo-pyridine derivatives. 3,790,586, Cl. 260-296.00h.
Irwin, John W.: *See—*
Devore, Ernest W.; and Irwin, John W., 3,790,954.
Isaksson, Sven-Erik: *See—*
Larker, Hans; Isaksson, Sven-Erik; Lindberg, Mats; and Granberg, Gunnar, 3,790,339.
Isaksson, Sven-Erik; Larker, Hans; and Lindberg, Mats, to Allmanna Svendka Elektriska Aktiebolaget. Cylindrical elongated furnace for treating material at high temperature in a gaseous atmosphere under high pressure. 3,790,340, Cl. 432-249.000.
Ishihara, Ko: *See—*
Niimi, Itaru; Hashimoto, Kametaro; Ushitani, Kenzi; Serino, Yoichi; Ishihara, Ko; Mitani, Seishu; and Imanishi, Kunizo, 3,790,351.
Ishijima, Hiroshi, to Nihon Denshi Kabushiki Kaisha. Device for X-ray analysis. 3,790,792, Cl. 250-278.000.
Ishikawa, Shinzaburo: *See—*
Tanigawa, Shizuhiko; Ishikawa, Shinzaburo; and Ono, Natsumi, 3,790,758.
Ishimaru, Wataru: *See—*
Enomoto, Koji; Ohtsuka, Kunio; and Ishimaru, Wataru, 3,789,863.
Ishimatsu, Kenji: *See—*
Inoue, Minoru; Ishimatsu, Kenji; and Tabuchi, Hideho, 3,790,782.
Ishizaki, Masao: *See—*
Mishimura, Shojiro; Ishizaki, Masao; Seo, Yoshiro; and Akima, Shinobu, 3,789,930.
Ishizuka Garasu Kabushiki Kaisha: *See—*
Kato, Taketosi; Umetsu, Masakazu; and Kobayashi, Toshio, 3,790,360.
Isono, Syoji, to Kabushiki Kaisha Daini Seikosha. Watertight watch case. 3,789,606, Cl. 58-90.00r.
Isotopes, Incorporated: *See—*
Webb, Geoffrey A. M.; and Phykitt, Howard P., 3,790,784.
Italiano, Frank; Tobin, Curtis L.; Martin, William C., Jr.; and Honnold, Fred V., Jr., to Carrier Corporation. Fan motor mount. 3,790,114, Cl. 248-13.000.
Ives, Frank E. Liquid resin spray dispensers. 3,790,030, Cl. 222-135.000.
Iwano, Haruhiko: *See—*
Shimamura, Isao; Okusut, Eiichi; Iijima, Yoo; and Iwano, Haruhiko, 3,790,383.
Iwasyk, John M.; and Rodeffer, David W., to Du Pont de Nemours, E. I., and Company. Apparatus for separating vapor from a viscous liquid. 3,789,584, Cl. 55-201.000.
Iyengar, Rama; and Zuber, Bretislav Paul, to Northern Electric Company Limited. Method of and apparatus for applying insulating discs to conductors. 3,789,480, Cl. 29-203.00c.
J. & P. Coats Limited: *See—*
Love, Ronald Barr; and Stewart, Allstair Templeton, 3,790,342.
Jacke, Stanley E.; and Jugler, John, to Branson Instruments Incorporated. Ultrasonic apparatus. 3,790,059, Cl. 228-1.000.
Jackman, Victor: *See—*
Laufe, Leonard E.; and Jackman, Victor, 3,789,849.
Jackson, Hewy E.; and Myers, Howard B., to Servco Company, The; division of Smith International Inc. Hard-facing article. 3,790,353, Cl. 29-182.700.
Jackson, Keith L., to General Steel Industries, Inc. Pneumatic railway center bearing. 3,789,771, Cl. 105-199.00c.
Jacob, Stanley W.: *See—*
Herschler, Robert J.; and Jacob, Stanley W., 3,790,682.
Jacobs, John F.: *See—*
Cotreau, Alex P.; and Jacobs, John F., 3,789,700.
Jacobson, Norman: *See—*
Rossi, Albert; Jacobson, Norman; and Miller, Harold N., 3,790,358.
Song, W. R.; and Jacobson, Norman, 3,790,483.
Jaddam, Abdulmassih Y., to GTE Laboratories Incorporated. Method of manufacturing an N-channel Mos field-effect transistor. 3,789,504, Cl. 29-521.000.
James, Randell Leland, to International Business Machines Corporation. Serial test patterns for MOSFET testing. 3,790,885, Cl. 324-73.00r.
James, Robert C.; Wilson, David A.; and Pringle, Frank E., Jr., to Hayssen Manufacturing Company. Gas flushing system for vertical form, fill and seal machines. 3,789,888, Cl. 141-4.000.
Janning, John L., to National Cash Register Company, The. Alignment film for a liquid crystal display cell and method of making same. 3,790,253, Cl. 350-160.0lc.
Janson, Bengt Gotthard. Method and apparatus for separating finer particles from coarse particles suspended in a liquid. 3,789,978, Cl. 209-10.000.
Japan Exlan Company, Limited: *See—*
Sone, Maso; Okazaki, Mitsutoshi; and Ueyama, Yasuomi, 3,790,434.
Japanese Geon Company, Ltd., The: *See—*
Saito, Yoshiomi; Sasaki, Hiroshi; Yamaguchi, Mamoru; Fukuda, Hide; Yamada, Humio; and Kimura, Koji, 3,790,524.
Jarecki, John S., to Skil Corporation. Hammer drill. 3,789,933, Cl. 173-48.000.
Jarema, Chester P.: *See—*
Niebylski, Leonard M.; and Jarema, Chester P., 3,790,365.
Jarry, Philippe, to Le Moteur Moderne. Rotary heat-exchanger. 3,789,917, Cl. 165-8.000.
Jedlicka, Woodrow Wilson, to Lubrizol Corporation, The. Novel, low-viscosity epoxy curing agents. 3,790,633, Cl. 260-561.00b.
Jen, Timothy Yu-Wen: *See—*
Blackburn, Dale W.; Devenney, Robert F.; and Jen, Timothy Yu-Wen, 3,790,573.
Jenei, Joseph, to General Motors Corporation. Method of making a sunshade. 3,790,420, Cl. 156-251.000.

Jenkins, Edgar W., Jr. Solid state dial selector signalling apparatus. 3,790,718, Cl. 179-17.00d.
Jenks, John W.: *See—*
Hamilton, Jack L.; Jenks, John W.; and Milberger, John F., 3,789,647.
Jerrf, Sven Torsten: *See—*
Martensson, Kjell Halvard; Linda, Bjorn Hison; Palsson, Jan Frederik; and Jerrf, Sven Torsten, 3,789,746.
Jespersen, Herbert A., to Outboard Marine Corporation. All-terrain vehicle. 3,790,230, Cl. 305-22.000.
Jet Spray Cooler, Inc.: *See—*
Gardner, John A., Jr.; and Brown, Merle S., 3,790,028.
Johannes, John H. Gooseneck trailer hitch fixture for pick-up trucks. 3,790,188, Cl. 280-423.000.
Johansson, Trik Lennart Waldemar. Device for holding a ring-formed workpiece intended to be machines on its inner envelope surface. 3,789,553, Cl. 51-237.00r.
Johns, Reed L. Dual wheel mounting device. 3,790,218, Cl. 301-36.00r.
Johns, Richard Bell, to Vann Brothers Limited. Dental handpieces. 3,789,506, Cl. 32-27.000.
Johnson, Alan J.; and Newman, Jack, to United States of America, Health, Education and Welfare. Method of removing hepatitis-associated antigen from a protein fraction using polyethylene glycol. 3,790,552, Cl. 260-112.00b.
Johnson, Peter Bennett; and Lee, Thomas Brian, to Fisons Limited. Bis-4-oxo-4H-1-benzopyrans. 3,790,580, Cl. 260-293.580.
Johnson, S. C., & Son, Inc.: *See—*
Thornton, James C.; and Whyte, Donald E., 3,790,081.
Jolly, Shelby A.: *See—*
Bolin, Larry R.; Hopper, Claude, Jr.; and Jolly, Shelby A., 3,790,852.
Jones, Cecil E., to Clark Equipment Company. Outrigger jack assembly. 3,790,133, Cl. 254-86.00r.
Jones, Daniel A., to United States of America, Navy. High/low aspect ratio dual-mode fin design. 3,790,104, Cl. 244-3.270.
Jones, Faber B., to Phillips Petroleum Company. Method of bonding using a polyamide resin. 3,790,423, Cl. 156-331.000.
Jones, Franklin D.: *See—*
Reisgies, Rolf W.; and Jones, Franklin D., 3,789,798.
Jones, Jack D.; and Collier, Everett J., to Procter & Gamble Company, The. Enzyme-containing detergent compositions. 3,790,482, Cl. 252-525.000.
Jones, James J., to Texas Instruments, Incorporated. Automatically adjustable switching circuit. 3,790,820, Cl. 307-237.000.
Jones, Robert A., to United States of America, National Aeronautics and Space Administration. Method for determining thermophysical properties of specimens. 3,789,654, Cl. 73-15.00r.
Jones, Robert L. Surface relief of concrete and method therefor. 3,789,759, Cl. 102-23.000.
Jorgensen, Stanley A.; and Adams, Stanley B., to Caterpillar Tractor Company. Dual steering system for articulated vehicles. 3,789,946, Cl. 180-79.20b.
Joubert, Robert Montaque, to Rotaque (Proprietary) Limited. Railway hopper car. 3,790,008, Cl. 214-63.000.
Jourquin, Lucien Edmond, to Gobapur S.A. Process for the agglomeration of flakes of expanded polyurethane. 3,790,422, Cl. 156-306.000.
Jugler, John: *See—*
Jacke, Stanley E.; and Jugler, John, 3,790,059.
Kabushiki Kaisha Akita: *See—*
Nakata, Kunii; and Kubo, Yoshimasa, 3,789,907.
Kabushiki Kaisha Daini Seikosha: *See—*
Isono, Syoji, 3,789,606.
Katagiri, Yoshio; and Miyata, Yoshio, 3,790,498.
Kabushiki Kaisha Kapau: *See—*
Hasebe, Sukehiro, 3,790,833.
Kabushiki Kaisha Kito: *See—*
Kanetake, Norio, 3,790,413.
Kabushiki Kaisha Kyoritsu: *See—*
Fujimura, Kinji; and Tanaka, Katsutoshi, 3,790,529.
Kabushiki Kaisha Nakamura Seisakujo: *See—*
Nakamura, Masaya, 3,790,172.
Kabushiki Kaisha Oji Yuksgoseishi Kenkyujo: *See—*
Ida, Saburo; and Tobita, Kuniharu, 3,789,975.
Kabushiki Kaisha Ricoh: *See—*
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Kabushiki Kaisha Seikosha: *See—*
Katagiri, Yoshio; and Miyata, Yoshio, 3,790,498.
Kabushiki Kaisha Suwa Seikosha: *See—*
Kishida, Motoki, 3,789,605.
Mitsui, Hiromitsu; Koike, Kenichi; and Kawamura, Yoshikazu, 3,789,681.
Nemotoi, Isao, 3,789,602.
Kabushiki Kaisha Tokat Rika Denki Seisakusho: *See—*
Nakashima, Yoshikatsu, 3,789,636.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Komatsu, Noboru; Nozaki, Choji; Kurauchi, Toshio; and Sakai, Toshihiko, 3,790,208.
Kaiser, Theodor, to Hoesch Werke Aktiengesellschaft. Centrally free giant bearing. 3,790,235, Cl. 308-101.000.
Kalitta, Carl L., to Dura Corporation. Vehicle bumper. 3,790,200, Cl. 293-98.000.
Kalkbrenner, Ralph W.: *See—*
United States of America, National Aeronautics and Space Administration, 3,789,920.
Kalle Aktiengesellschaft: *See—*
Dryczynski, Kurt; Kramer, Heinz; Messner, Dieter; and Seifried, Walter, 3,790,854.
Schmidt, Willi J.; Kornelli, Wolfgang; and Werner, Eberhard, 3,790,056.
Steppan, Hartmut; Uhlig, Fritz; and Giesse, Roland, 3,790,385.
Kalontarov, Iosif Yakubovich: *See—*
Makhkamov, Kajum; Kalontarov, Iosif Yakubovich; and Repina, Eleonora Nikolaevna, 3,790,341.
Kaltenborn, David A.: *See—*
Lesyk, Leo; and Kaltenborn, David A., 3,790,904.
Kamin, Gerhard Robert, to Fernseh G.m.b.H. Interference signal compensating. 3,790,705, Cl. 178-7.100.
Kamiya, Yoji: *See—*
Kurimoto, Mikishi; Munekata, Keniti; and Kamiya, Yoji, 3,789,501.
Kampert, Keith W.; and Houtz, Kenneth E., to International Harvester Company. Vehicle drive and power control means. 3,789,943, Cl. 180-66.00r.
Kampf, Julian C.; and Retzer, Kenneth W., to Square D Company. Excitation control circuit for electromagnet coil. 3,790,862, Cl. 317-148.50r.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Oshima, Akio; Oshima, Hiroshi; and Kombashiri, Takamichi, 3,790,641.
Kaneko, Eigi; and Nakajima, Masa. Chromium plating bath. 3,790,455, Cl. 204-51.000.
Kanetake, Norio, to Kabushiki Kaisha Kito. Process for a continuous heat treatment and apparatus therefor. 3,790,413, Cl. 148-16.500.
Kanno, Hiroaki. Clamping iron for ski boots. 3,790,186, Cl. 280-11.35c.
Kapitany, Hans: *See—*
Slamecka, Ernst; Kapitany, Hans; and Zemann, Egon, 3,790,732.
Karden, Karl Gosta: *See—*
Schoeps, Knut Christian; and Karden, Karl Gosta, 3,789,934.
Karklys, Joseph, to Whirlpool Corporation. Electronic control circuit for appliances. 3,790,815, Cl. 307-141.000.
Karlyn, David A., to USM Corporation. Corrosion-resistant alloy. 3,790,371, Cl. 75-170.000.
Karwowski, James Paul: *See—*
Theriault, Robert John; Karwowski, James Paul; and Wideburg, Norman Earl, 3,790,578.
Kaspaul, Erika E.: *See—*
McKee, William E.; and Kaspaul, Erika E., 3,790,380.
Kasuga, Kazunori: *See—*
Irikura, Tsutomu; Kasuga, Kazunori; Hashizume, Tacko; Ohasi, Mitsuo; Yuge, Masuo; and Yamada, Michiko, 3,790,586.
Kasuga, Noboru: *See—*
Hanyo, Susomo; and Kasuga, Noboru, 3,789,784.
Katagiri, Yoshio; and Miyata, Yoshio, to Kabushiki Kaisha Daini Seikosha and Kabushiki Kaisha Seikosha. Memory liquid crystal compositions. 3,790,498, Cl. 252-408.000.
Kato, Taketosi; Umetsu, Masakazu; and Kobayashi, Toshio, to Ishizuka Garasu Kabushiki Kaisha. Process for producing metal coated glass-ceramic articles. 3,790,360, Cl. 65-32.000.
Katterheinrich, Fred H.; and Fox, Gerald B., to Hobart Manufacturing Company, The. Method and apparatus for treating dishwasher discharge. 3,789,860, Cl. 134-104.000.
Kawada, Takehiko, to Denki Onkyo Co., Ltd. High voltage generating device having an operational monitoring device. 3,790,826, Cl. 310-8.100.
Kawagoi, Takahiro: *See—*
Onishi, Akira; Irako, Koichi; Hayakawa, Yoshihiro; Shimomura, Takeshi; Kawagoi, Takahiro; and Miyamoto, Shoji, 3,790,539.
Kawaguchi, Takeski, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for automatic pad adjustment in disk brakes. 3,789,959, Cl. 188-71.900.
Kawakami, Koichi, to Yoshida Kogyo Kabushiki Kaisha. Slider and end stop applying machine for a slide fastener chain. 3,789,487, Cl. 29-207.551.
Kawamura, Yoshikazu: *See—*
Mitsui, Hiromitsu; Koike, Kenichi; and Kawamura, Yoshikazu, 3,789,681.
Keim, Melville. Method of detecting wind at a mid-point of a sail and means therefor. 3,789,793, Cl. 116-114.00r.
Keitel, Gerald A., to GTE Automatic Electric Laboratories, Incorporated. Edge mount connector terminal. 3,790,916, Cl. 339-95.00r.
Keithley Instruments, Inc.: *See—*
Brokaw, Adrina Paul, 3,790,878.
Kurtin, Stephen; Anthony, Michael; and Watrous, Willis, 3,790,886.
Kel-Win Manufacturing Company: *See—*
Keller, Robert J., III, 3,789,870.
Kel-Win Manufacturing Company, Inc.: *See—*
Keller, Robert J., III, 3,789,862.
Keller, Robert J., III, to Kel-Win Manufacturing Company, Inc. Disposable valve construction and method of making seals. 3,789,862, Cl. 137-15.000.
Keller, Robert J., III, to Kel-Win Manufacturing Company. Disposable valve construction and method of making seals. 3,789,870, Cl. 137-454.500.

Kellow, Allan Neville. Target sighting systems. 3,790,248, Cl. 350-10.000.

Kelsey-Hayes Company: *See*—
Liggett, John V., 3,790,226.

Kelstan Plastic Products Limited: *See*—
Kimberley, Stanley H., 3,790,194.

Kempton, Calvin E.; and Reinicke, Robert H., to Parker Hannifin Corporation. Solenoid valve with electronic position indicator. 3,789,876, Cl. 137-554.000.

Kendall, George A.; and Roseberry, Donald E., to Wickers Corporation, The. Orbital crankshaft lathe. 3,789,709, Cl. 82-9.000.

Kendick Manufacturing Co.: *See*—
Bugg, Kenly C., 3,789,525.

Kennedy, James; Long, Alan Gibson; and Underwood, William George Elphinstone, to Glaxo Laboratories, Limited. Cephalosporin compounds. 3,790,567, Cl. 260-243.00c.

Kern, Pierre: *See*—
Bert, Alain; Enjalbert, Roger; and Kern, Pierre, 3,790,843.

Kersten, George Paul Franz. Methods and devices for packing and loading ammunition. 3,789,531, Cl. 42-87.000.

Kerwood, Joseph Edward; and Leib, Robert I., to Monsanto Company. Process for preparing thioamines. 3,790,568, Cl. 260-247.00s.

Keshishian, Vahe, to Rockwell International Corporation. Radioisotope fuel material and method. 3,790,440, Cl. 252-301.10r.

Keskitalo, Tage O.: *See*—
Widegren, Lars H.; and Keskitalo, Tage O., 3,789,952.

Kessler, Gerald. Unitary rigid edge channel for windows. 3,789,564, Cl. 52-127.000.

Kessler, Lawrence W.; and Korpel, Adrianus, to Zenith Radio Corporation. Combined system for acoustical-optical microscopy. 3,790,281, Cl. 356-72.000.

Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Co., K.G.: *See*—
Stolzer, Paul, 3,789,717.

Kick, Hermann; and Schwyn, Walter, to Maier, Carl, & Cie. Electrical circuit-breaker. 3,790,911, Cl. 335-201.000.

Kienhofer, Manfred: *See*—
Hempelmann, Wilhelm; Waldenmeier, Gunter; and Kienhofer, Manfred, 3,790,128.

Kieronski, John P., to Whitin Machine Works, Inc. Roving frame bolster. 3,789,598, Cl. 57-71.000.

Kiesluch, Klaus: *See*—
Gibiani, Heinz; Kiesluch, Klaus; Koch, Hans-Joachim; Kosmol, Horst; Rufer, Clemens; Schroder, Eberhard; and Walsh, Rosemarie, nee Vossing, 3,790,445.

Kifer, David E., to Oatey, Co. Follow plate for dispensing material. 3,790,038, Cl. 222-386.000.

Kijkstra, Waling, to Zandleven Curacao N.V. Method for marking metal blocks and the marked articles. 3,790,398, Cl. 117-37.00r.

Kilduff, Herbert, to Leesona Corporation. Bobbin. 3,790,100, Cl. 242-118.320.

Kilroy, Oliver B. Hydraulic mining system. 3,790,214, Cl. 299-8.000.

Kim, Sung Soo; and Dusseau, Andress. Expandable trochar, especially for medical purposes. 3,789,852, Cl. 128-347.000.

Kimball, Robert B.: *See*—
United States of America, National Aeronautics and Space Administration, 3,790,347.

Kimberley, Stanley H., to Kelstan Plastic Products Limited. Pipe coupling. 3,790,194, Cl. 285-373.000.

Kimura, Koji: *See*—
Saito, Yoshiomi; Sasaki, Hiroshi; Yamaguchi, Mamoru; Fukuda, Hide; Yamada, Humio; and Kimura, Koji, 3,790,524.

Kimura, Shinji; Fukui, Norihiro; and Nagai, Yasuhiro, to Kobe Steel, Ltd. Welding electrode having a non-conductive tip for semi-automatic continuous arc welding machine. 3,790,743, Cl. 219-130.000.

Kimura, Tsutomu: *See*—
Takahashi, Isao; and Kimura, Tsutomu, 3,790,789.

Kincaid, James F.; and MacLeod, David E., to Carrier Corporation. Apparatus for hinging a discharge door to an air conditioning unit. 3,789,619, Cl. 62-262.000.

King, John G., to Massachusetts Institute of Technology. Molecular scanner. 3,790,793, Cl. 250-251.000.

Kinsley, George R., to Scott Paper Company. Safety air nozzle. 3,790,084, Cl. 239-291.000.

Kinzel, Gary L.: *See*—
Groom, Jack J.; and Kinzel, Gary L., 3,789,511.

Kirby, Russell F. Toy automobile speed trap device. 3,789,543, Cl. 46-1.00r.

Kirkes, William O. Process and apparatus for constructing foundations and setting prefabricated buildings thereon. 3,789,559, Cl. 52-169.000.

Kirkland, A., & Company Limited: *See*—
Carrotte, Frederick Henry; and Ellis, John Ernest, 3,789,629.

Kiselev, Vasily Pavlovich: *See*—
Brusakov, Jury Ivanovich; Sirotkin, Nikolai Nikolaevich; Kiselev, Vasily Pavlovich; Ilinkov, Dmitry Vladimirovich; Pavlovichavdely, Mikhail; Marin, Semen Panteleevich; Shkarupa, Alexandr Ivanovich; Veisman, Boris Ottovich; Lebedev, Vladimir Nikolaevich; an Gavrilenko, Nikolai Pavlovich, 3,790,692.

Kishida, Motoki, to Kabushiki Kaisha Suwa Seikosha. Gold plated cases for time-keeping instruments. 3,789,605, Cl. 58-88.00r.

Kiss, Kornel D.; Mills, George S.; and Smolin, Edwin M., to GAF Corporation. Ozone treated phenolic polymer tackifier for ethylene propylene diene rubbers. 3,790,647, Cl. 260-897.00r.

Kitamura, Hajime: *See*—
Koyanagi, Shunichi; Kitamura, Hajime; Ogawa, Kinya; and Shimizu, Toshihide, 3,790,542.

Kiyotoshi, Tadahiro: *See*—
Motani, Kensuke; Kiyotoshi, Tadahiro; and Nakahara, Akihiko, 3,790,535.

Kiyozumi, Kentaro: *See*—
Owaki, Kenichi; Kiyozumi, Kentaro; and Nakayama, Northiko, 3,789,470.

Klavsons, Uldis; and Michaels, Thomas B., to Xerox Corporation. Regulator for xerographic fusing apparatus. 3,790,747, Cl. 219-216.000.

Kleiner, Hans-Jerg, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. (Hydroxy or alkanoyloxy alkylene)dihydrocarbyl phosphine oxides. 3,790,638, Cl. 260-606.50p.

Klemt, Arthur, to Klemt, Arthur, Kommanditgesellschaft. Raster process for classifying characters. 3,790,955, Cl. 340-146.3ma.

Klemt, Arthur, Kommanditgesellschaft: *See*—
Klemt, Arthur, 3,790,955.

Klevtsov, Valery Alexeevich: *See*—
Manyafov, Valery Nikolaevich; Busheev, Anatoly Ivanovich; Semenov, Roman Lvovich; and Klevtsov, Valery Alexeevich, 3,790,000.

Klimo, Robert G., to Cleveland Machine Controls, Inc. Motor drive control system. 3,790,874, Cl. 318-327.000.

Klink, Wolf-Dieter. Lock for motor vehicle safety belt. 3,789,492, Cl. 24-230.0al.

Kloimstein, Engelbert: *See*—
Diskus, Alfred; Schonbeck, Rupert; Kloimstein, Engelbert; and Mayr, Hubert, 3,790,571.

Knapp, Robert G.: *See*—
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Moust, Daniel A., 3,789,846.

Knapp, William H., 20% to Lee, Raymond, Organization, Inc., The. Retractable stairway device. 3,789,955, Cl. 182-78.000.

Knapsack Aktiengesellschaft: *See*—
Wasel-Nielen, Horst Dieter; and Heyner, Gero, 3,790,661.

Knechiel, Wilhelm; Petersdorf, Gerhard; and Sandner, Winfried, to Canon Kabushiki Kaisha. Copying apparatus. 3,790,272, Cl. 355-51.000.

Knell, Martin: *See*—
Dexter, Martin; Knell, Martin; and Peterli, Hans Jakob, 3,790,597.

Knief, Chester L., to Phillips Petroleum Company. Guiding and positioning apparatus. 3,789,922, Cl. 166-.500.

Knobel, F., Elektro-Apparatebau AG: *See*—
Landolt, Josef, 3,790,919.

Knoell, John; and Siewn, Eric, to Knoell, John, & Son, Inc. Display case. 3,789,528, Cl. 40-152.000.

Knoell, John, & Son, Inc.: *See*—
Knoell, John; and Siewn, Eric, 3,789,528.

Knoll, William C., to GTE Sylvania, Incorporated. Fluid level detector. 3,790,936, Cl. 340-244.00e.

Knoos, Stellan: *See*—
Bostrom, Bertil Ingemar; Ljungsahl, Soren Folkl Samuel; and Knoos, Stellan, 3,789,494.

Knorr-Bremse GmbH: *See*—
Strohmer, Alfred; and Raj, Joachim, 3,789,769.

Kobayashi, Akira: *See*—
Yagi, Yoshiharu; Kobayashi, Akira; and Sato, Hiroshi, 3,790,551.

Kobayashi, Takashi, to Yokohama Rubber Company, Limited, The. Pneumatic tires. 3,789,899, Cl. 152-356.000.

Kobayashi, Toshio: *See*—
Kato, Taketosi; Umetsu, Masakazu; and Kobayashi, Toshio, 3,790,360.

Kobe Steel, Ltd.: *See*—
Kimura, Shinji; Fukui, Norihiro; and Nagai, Yasuhiro, 3,790,743.
Mishimura, Shojiro; Ishizaki, Masao; Seo, Yoshiro; and Akima, Shinobu, 3,789,930.

Koch, Friedrich; and Zeug, Hubert, to Desma-Werke GmbH. Die casting machine. 3,790,136, Cl. 259-192.000.

Koch, Hans-Joachim: *See*—
Gibiani, Heinz; Kiesluch, Klaus; Koch, Hans-Joachim; Kosmol, Horst; Rufer, Clemens; Schroder, Eberhard; and Walsh, Rosemarie, nee Vossing, 3,790,445.

Koch, Robert E.: *See*—
Rusk, Gerald R.; and Koch, Robert E., 3,789,912.

Kocher, Erich J., to Vilter Manufacturing Corporation. Gas compressor having rolling type sealing diaphragm. 3,789,675, Cl. 74-18.200.

Kodama, Mikio, to Fuji Spinning Co., Ltd. Yarn treating method. 3,789,469, Cl. 28-72.600.

Koeper, John I., to Crown Controls Corporation. Battery operated motor vehicle lamp warning flashing circuit. 3,790,934, Cl. 340-81.00r.

Koerner, Ernest C.; Wareham, William W.; and Bisque, Donny R., to Phelps Dodge Magnet Wire Corporation. Method of making amide-imide resins, aromatic amides and aromatic polyamide resins. 3,790,530, Cl. 260-77.50r.

Koetting, Jerome D.: *See*—
Fox, Joseph S.; and Koetting, Jerome D., 3,790,658.

Kogan, Iosif Yakovlevich: *See*—
Kozlovsky, Anatoly Avgustinovich; Paschenko, Nikolai Evgenievich; Polyakov, Vladimir Grigorievich; and Kogan, Iosif Yakovlevich, 3,789,997.

Kohart, Ralph A., to Omark Industries, Inc. Stud storage system. 3,789,490, Cl. 29-211.00r.

Kohfeldt, Werner: *See—*
Vice, Gunter; and Kohfeldt, Werner, 3,789,906.

Kohl, Douglas A. Severe thunderstorm detector. 3,790,884, Cl. 324-72.000.

Koike, Kenichi: *See—*
Mitsui, Hiromitsu; Koike, Kenichi; and Kawamura, Yoshikazu, 3,789,681.

Koizumi, Masaharu; and Yusawa, Motoyasu, to Mitsui Petrochemical Industries, Ltd. Crystalline polypropylene compositions. 3,790,517, Cl. 260-23.00h.

Kolene Corporation: *See—*
Shoemaker, Robert H.; and Wood, William G., 3,790,489.

Kolkka, Toivo I. Rock heater for sauna bath. 3,789,827, Cl. 126-344.000.

Komatsu, Noboru; Nozaki, Choji; Kurauchi, Toshio; and Sakai, Toshihiko, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Safety belt. 3,790,208, Cl. 297-386.000.

Kombashiri, Takamichi: *See—*
Oshima, Akio; Oshima, Hiroshi; and Kombashiri, Takamichi, 3,790,641.

Kominami, Naoya; Tamura, Nobuhiro; Mikami, Hiroshi; and Yamamoto, Etsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Selective disproportionation of cresols. 3,790,642, Cl. 260-621.00d.

Konig, Wolfgang; and Geiger, Rolf, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. NW-4,4-dimethoxybenzhydryl derivatives of asparagine and glutamine. 3,790,618, Cl. 260-471.00a.

Konishi, Kazuo: *See—*
Sakai, Michihiko; Sato, Yasuo; Mortmoro, Rokuya; Konishi, Kazuo; and Maki, Katsuyuki, 3,790,621.

Konno, Kazuhiko: *See—*
Shinohara, Hiroyuki; Ohashi, Hiroaki; and Konno, Kazuhiko, 3,790,626.

Konno, Mitsuhiro: *See—*
Matsumura, Shinji; and Konno, Mitsuhiro, 3,790,736.

Kopaniky, Dennis R.; and Gann, Donald S. Thermoelectric probe apparatus for tissue fluid flow measurement. 3,789,831, Cl. 128-2.05f.

Kopcika, Norman S.: *See—*
Farhat, Nabil H.; and Kopcika, Norman S., 3,790,895.

Koppers Company, Inc.: *See—*
Hale, Elden A., 3,789,879.

Korn, Roland: *See—*
Gramer, Gottfried; and Korn, Roland, 3,789,577.

Kornelli, Wolfgang: *See—*
Schmidt, Willi J.; Kornelli, Wolfgang; and Werner, Eberhard, 3,790,056.

Korolkov, Ivan Alexandrovich: *See—*
Razgulov, Mikhail Mikhailovich; Astafiev, Georgy Vasilievich; and Korolkov, Ivan Alexandrovich, 3,790,057.

Korpel, Adrianus: *See—*
Kessler, Lawrence W.; and Korpel, Adrianus, 3,790,281.

Korsch, Dietrich, to Bendix Corporation, The. All reflective image space scanning device. 3,790,247, Cl. 350-7.000.

Korsch, Emil, Spezialfabrik fur Kompromiermaschinen, Firma: *See—*
Marfiewicz, Wilhelm, 3,790,318.

Kosa, Yasunobu: *See—*
Nishida, Sumio; and Kosa, Yasunobu, 3,789,503.

Kosco, Thomas J.: *See—*
Callais, Richard T.; Eisenberg, Herbert; Forbes, F. Douglas; Kosco, Thomas J.; Taxin, Harry M.; and Frost, John B., 3,790,700.

Koshei Arita: *See—*
Matsumura, Shinji; and Konno, Mitsuhiro, 3,790,736.

Kosmol, Horst: *See—*
Gibiani, Heinz; Kiesluch, Klaus; Koch, Hans-Joachim; Kosmol, Horst; Rufer, Clemens; Schroder, Eberhard; and Walsh, Rosemarie, nee Vossing, 3,790,445.

Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Process for removing hydrogen silanes from chlorosilanes. 3,790,459, Cl. 204-157.100.

Koutnik, Rodrick J. Retractable tie rack. 3,789,994, Cl. 211-86.000.

Kowalik, John J., to International Harvester Company. Close coupled frame steered all crawler tractor. 3,789,942, Cl. 180-9.440.

Koyanagi, Shunichi; Kitamura, Hajime; Ogawa, Kinya; and Shimizu, Toshihide, to Shinetsu Chemical Company. Method for polymerizing vinyl chloride. 3,790,542, Cl. 260-92.80r.

Kozlovsky, Anatoly Avgustinovich; Paschenko, Nikolai Evgenievich; Polyakov, Vladimir Grigorievich; and Kogan, Iosif Yakovlevich. Tower crane. 3,789,997, Cl. 212-11.000.

Kozulla, Robert E.; and Silagy, Richard J., to Weatherhead Company, The. Refrigeration service valve. 3,789,881, Cl. 137-625.480.

Kraay, Russell J.; and Farkas, Eugene, to Lilly, Eli, and Company. 17 Alpha-ethynylestriol 3-cyclopentyl ether. 3,790,605, Cl. 260-397.500.

Kraft, Joseph K., to Westinghouse Electric Corporation. Transportation device. 3,789,972, Cl. 198-16.00r.

Kraft, Wayne O.: *See—*
Gubala, Thomas J.; and Kraft, Wayne O., 3,790,706.

Kramer, Heinz: *See—*
Dryczynski, Kurt; Kramer, Heinz; Messner, Dieter; and Seifried, Walter, 3,790,854.

Kramer, Robert G., to Diamond International Corporation. Simulated prewrap carton and automatic lock bottom arrangement. 3,790,064, Cl. 229-37.00r.

Krammer, Robert, to Seatech Engineering, Inc. Subfloor towline conveyor system. 3,789,767, Cl. 104-172.0bt.

Krasnev, Tibor Ferentsevich: *See—*
Lipshits, Viktor Senderovich; Andrianov, Vladimir Rubenovich; Rykalin, Nikolai Nikolaevich; Krasnev, Tibor Ferentsevich; Podola, Nikolai Vasilievich; and Krivonos, Vadim Petrovich, 3,790,739.

Kraus, Gerard, to Phillips Petroleum Company. Carbon black testing by analyzing non-specularly reflected polarized light. 3,790,286, Cl. 356-118.000.

Krause, Erich: *See—*
Schieber, Hans; and Krause, Erich, 3,789,630.

Krawczyk, Charles C.: *See—*
Munroe, Donald M., 3,790,937.

Krehbiel, Robert D.; and Graber, Homer R., to Cessna Aircraft Company, The. Remote hydraulic control. 3,789,739, Cl. 91-358.00a.

Kreider, Eunice M., to Searle, G. D., & Co. N-(1-(3-cyano-3,3-bis(optionally substituted phenyl)propyl)-4-phenylpiperidine-4-carbonyloxy) succinimides. 3,790,581, Cl. 260-293.710.

Krieger, Heinrich. Structural element of reinforced concrete. 3,790,746, Cl. 219-213.000.

Krivonos, Vadim Petrovich: *See—*
Lipshits, Viktor Senderovich; Andrianov, Vladimir Rubenovich; Rykalin, Nikolai Nikolaevich; Krasnev, Tibor Ferentsevich; Podola, Nikolai Vasilievich; and Krivonos, Vadim Petrovich, 3,790,739.

Krochock, David Arthur; and Laiderman, Donald David, to Gillette Company, The. Film-forming organic polymer-modified starch material hair setting composition. 3,790,664, Cl. 424-47.000.

Kron, Reuben E., to University of Pennsylvania, Trustees, The. Instrumented newborn nursing system. 3,790,016, Cl. 215-11.00r.

Krongos, Zaharias. Water filter device. 3,789,991, Cl. 210-317.000.

Krumbein, Fritz, to Bosch, Robert, Photokino GmbH. Variable-speed belt gear. 3,789,685, Cl. 74-242.300.

Krupa, John E., to United States of America, Navy. Radio frequency switching circuit. 3,790,824, Cl. 307-256.000.

Kubo, Yoshimasa: *See—*
Nakata, Kunii; and Kubo, Yoshimasa, 3,789,907.

Kubodera, Seiiti: *See—*
Shiba, Keisuke; Sano, Kazuya; Okumura, Akio; and Kubodera, Seiiti, 3,790,388.

Kubota, Yasuharu; and Shiono, Ryuji, to Sony Corporation. Gamma correction circuit. 3,790,702, Cl. 178-5.40r.

Kugler, Walter. Material conveyance system for feeding workpieces to a processing tool. 3,789,973, Cl. 198-19.000.

Kuhn, L. Dean: *See—*
Faust, Silwart W.; and Kuhn, L. Dean, 3,789,514.

Kuhn, L. Dean, to Maytag Company, The. Heater assembly for dryer. 3,790,751, Cl. 219-525.000.

Kuhnel, Alfred: *See—*
Paolini, Frank; and Kuhnel, Alfred, 3,790,785.

Kunii Nakata: *See—*
Nakata, Kunii; and Kubo, Yoshimasa, 3,789,907.

Kurashiki Rayon Co., Ltd.: *See—*
Hasada, Yoshiyasu; and Yasue, Teruo, 3,790,617.

Kurauchi, Toshio: *See—*
Komatsu, Noboru; Nozaki, Choji; Kurauchi, Toshio; and Sakai, Toshihiko, 3,790,208.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Murayama, Naohiro; and Fukuda, Makoto, 3,790,645.

Kurimoto, Mikishi; Munekata, Keniti; and Kamiya, Yoji, to Toyoda Koki Kabushiki Kaisha. Machine tool with tool change device. 3,789,501, Cl. 29-568.000.

Kurosaki, Teikichi; Odaka, Munchiko; and Hanaoka, Satoshi, to Nippon Zoki Pharmaceutical Co., Ltd. Glycolic ether suitable as medicament. 3,790,640, Cl. 260-615.00r.

Kurtin, Stephen; Anthony, Michael; and Watrous, Willis, to Keithley Instruments, Inc. Electrical measurement instrument having an improved analog to digital converter. 3,790,886, Cl. 324-99.00d.

Kurumada, Tomoyuki: *See—*
Murayama, Keisuke; Toda, Toshimasa; Mori, Eiko; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Watanabe, Ichiro, 3,790,525.

Kuster, Karl H., to GTE Automatic Electric Laboratories, Incorporated. MOS memory power supply. 3,790,809, Cl. 307-41.000.

Kuzmik, John J., to MacDermid Incorporated. Preparation of plastic substrates for electroless plating and solutions therefor. 3,790,400, Cl. 117-47.00a.

Kvernelands Fabrikk A/S: *See—*
Nja, Olav, 3,789,928.

Kyorin Seiyaku Kabushiki Kaisha: *See—*
Irikura, Tsutomu; Kasuga, Kazunori; Hashizume, Taeko; Ohasi, Mitsuo; Yuge, Masuo; and Yamada, Michiko, 3,790,586.

La Framboise, Leo F.: *See—*
Hyde, A. P. Stanley; and La Framboise, Leo F., 3,790,317.

La Perre, James D.; Dyrud, James F.; and Zosel, Thomas W., to Minnesota Mining and Manufacturing Company. Printable, heat-bondable sheet material. 3,790,439, Cl. 161-167.000.

La Ros Equipment Company, Inc.: *See—*
Rossio, John H., 3,789,981.

La Trombe: *See—*

Pozzi, Jean-Pierre, 3,789,432.
Laboratories Houde: *See—*
Fourneau, Jean-Pierre, 3,790,623.
Lack, John: *See—*
Beck, Roderick; Harman, James F.; Shatila, Mounir A.; Richins, David A.; and Lack, John, 3,789,750.
Ladan, Stephan George: *See—*
Henderson, Ian H. S.; and Ladan, Stephan George, 3,790,454.
Ladd Research Industries, Inc.: *See—*
Porter, John H.; and Murray, David B., 3,789,667.
Lai, Thomas K. Y. Automatic light control system. 3,790,848, Cl. 315-155.000.
Laiderman, Donald David: *See—*
Krochock, David Arthur; and Laiderman, Donald David, 3,790,664.
L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Duprat, Jacques; and De Roissart, Henri, 3,789,515.
Laitner Brush Company: *See—*
Laitner, Walter William, 3,789,451.
Laitner, Walter William, to Laitner Brush Company. Window cleaning implement. 3,789,451, Cl. 15-118.000.
Lalancette, Jean-Marc, to Universite de Sherbrooke. Removal and recovery of metals from polluted waters. 3,790,370, Cl. 75-108.000.
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., to American Petroscience Corporation. Telemetering system for oil wells. 3,790,930, Cl. 340-18.0nc.
Landolt, Josef, to Knobel, F., Elektro-Apparatebau AG. Contact piece for the solderless connection of an insulated electrical conductor and method of using same. 3,790,919, Cl. 339-97.00p.
Laney, Bill C.: *See—*
Grable, Donovan B., 3,790,213.
Langer, Arthur W., Jr., to Esso Research and Engineering Company. Ethylene vinyl aromatic telomer waxes and processes of preparing them. 3,790,541, Cl. 260-88.20c.
Langer, Paul: *See—*
Dao, Wolfram; Langer, Paul; and Gritzan, Hans, 3,789,967.
Langlois, Joseph R. Detachable propeller blade. 3,790,304, Cl. 416-207.000.
Langmead, Walter Alfred: *See—*
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Mayne, William Harry; and Crump, Thomas R., to Petty Geophysical Engineering Company. Skip-spread method for seismic surveying. 3,790,929, Cl. 340-15.5mc.
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McCartney, Daniel E.; and Mitsche, Roy T., to Universal Oil Products Company. Method of manufacturing a germanium catalyst. 3,790,503, Cl. 252-442.000.
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Miller, Darrow L., to North American Rockwell Corporation. Rectilinear acoustical transducer inspection apparatus. 3,789,656, Cl. 73-71.500.
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Miller, Robert C., to Safeway Products, Inc. Water bed heater. 3,790,753, Cl. 219-528.000.
Miller, Stewart Edward, to Bell Telephone Laboratories, Incorporated. Fundamental transverse mode operation in solid state lasers. 3,790,902, Cl. 331-94.50c.
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Millmaster Onyx Corporation: *See—*
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Moertel, George B., to Textron, Inc. Slide fastener device. 3,789,465, Cl. 24-205.0hc.
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Montague, Bernard R.; Leyburn, Derek; Barker, John; Hannley, Ray John; Leblanc, Vincent G.; and Tam, Leslie K., to Bell Canada. Method and means for connecting branch exchanges. 3,790,719, Cl. 179-18.0ad.

Montgomery, Marshall A.; Thier, Herbert D.; and Oreli, John D., to American Science & Engineering Inc. Rotoplane platform energy source. 3,789,519, Cl. 35-19.00r.

Montijn, Paulus P.; and Haddock, Ernest, to Shell Oil Company. Herbicidal imido esters. 3,790,614, Cl. 260-453.00r.

Moore, Arthur H., to Radiant Energy Systems, Inc., mesne. Semiconductor wafer fracturing technique employing a sure controlled roller. 3,790,051, Cl. 225-1.000.

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Moorefield, James F., II, to Loew's Theaters, Inc. Apparatus for separating material from a pneumatic conveyor. 3,789,587, Cl. 55-290.000.

Moran, Thomas M., to Eaton Corporation. Fastener. 3,789,724, Cl. 85-32.00v.

Moran, Thomas M., to Eaton Corporation. Fastener. 3,789,727, Cl. 85-71.000.

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Morel, Marcel; and Lepareur, Lucien. Anti-pollution supply device for internal combustion engines. 3,789,817, Cl. 123-133.000.

Moreng, Joseph H., to Moreng, Joseph, Iron Works, Inc. Portable, collapsible steeplechase hurdle or fence. 3,789,801, Cl. 119-29.000.

Moreng, Joseph, Iron Works, Inc.: *See—*
Moreng, Joseph H., 3,789,801.

Morgan, Thomas, to G & H Technology, Inc. Electrical contact terminal hand tool. 3,789,484, Cl. 29-203.00h.

Morgan, Thomas Richard: *See—*
Bruen, Charles Patrick; Wamser, Christian Albert; and Morgan, Thomas Richard, 3,790,456.

Mori, Eiko: *See—*
Murayama, Keisuke; Toda, Toshimasa; Mori, Eiko; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Watanabe, Ichiro, 3,790,525.

Morilli, Frank Peter. Hawk. 3,790,201, Cl. 294-3.500.

Morita, Tetsuro: *See—*
Iizuka, Yoshio; and Morita, Tetsuro, 3,790,894.

Morley Furniture Spring Corporation: *See—*
Crosby, Lawton H., 3,790,149.

Morong, William H., Jr., to General Electric Company. Lag adjustment means for a watthour meter. 3,790,888, Cl. 324-138.000.

Morreale, Anthony P., to Computer Devices Corporation. Apparatus for damping oscillations in a stepping motor. 3,790,831, Cl. 310-94.000.

Morrell, John Anthony: *See—*
Gardner, David Stanley John; and Morrell, John Anthony, 3,790,686.

Morris, Carrol V., to Snorkel Tire Equipment Company. Fire-fighting apparatus and elongate cantilever boom assembly therefor. 3,789,869, Cl. 137-351.000.

Morris, James J.: *See—*
Sweeney, Thomas E.; Schweizer, William S.; and Morris, James J., 3,790,106.

Morris, Marion H. Automatic load monitoring and transfer circuit. 3,790,846, Cl. 315-91.000.

Morrison, Howard J., to Glass, Marvin & Associates. Pillow with hand puppet receivable in a pocket thereof and manipulable while therein. 3,789,546, Cl. 46-116.000.

Morrison, Terry, to Chandler Evans Inc. Governor with integrator reset. 3,790,765, Cl. 235-150.100.

Morse Manufacturing Co., Inc.: *See—*
Lighthipe, Charles H., Jr.; and Andrews, Robert R., 3,790,204.

Mortmoro, Rokuya: *See—*
Sakai, Michihiko; Sato, Yasuo; Mortmoro, Rokuya; Konishi, Kazuo; and Maki, Katsuyuki, 3,790,621.

Mosler Safe Company, The: *See—*
Tearne, David; and Weissmuller, Adam, 3,790,102.
Weissmuller, Adam, 3,790,101.

Mosser Industries, Incorporated: *See—*
Hagar, Donald K., 3,790,131.

Motani, Kensuke; Kiyotoshi, Tadahiro; and Nakahara, Akihiko, to Tokuyama Soda Kabushiki Kaisha. Method of regenerating chelate resins having mercury adsorbed thereto. 3,790,535, Cl. 260-79.000.

Motter, John C.; Motter, John C., Jr.; and Swagert, Dean R., to Motter, John C., Printing Press Co. Printing press having automatic printing cylinder loading and unloading apparatus. 3,789,757, Cl. 101-153.000.

Motter, John C., Jr.: *See—*
Motter, John C.; Motter, John C., Jr.; and Swagert, Dean R., 3,789,757.

Motter, John C., Printing Press Co.: *See—*
Motter, John C.; Motter, John C., Jr.; and Swagert, Dean R., 3,789,757.

Mottu, Andre; and Heimann, Arnold, to Societe Genevoise d'Instruments de Physique. Device for the driving of a tool by means of the spindle of a machine-tool. 3,790,296, Cl. 408-239.000.

Moulds, John W., to General Motors Corporation. Fuel rail vapor bleed. 3,789,819, Cl. 123-140.0mp.

Moust, Daniel A.: *See—*
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Moust, Daniel A., 3,789,846.

Mozdenski, Bernard; and Mozdenski, Bernard T., 20% to Lee, Raymond, Organization, Inc., The. Painter's pal. 3,789,450, Cl. 15-105.000.

Mozdenski, Bernard T.: *See—*
Mozdenski, Bernard; and Mozdenski, Bernard T., 3,789,450.

M.S.C. Inc., mesne: *See—*
Paul, Dwight D., Jr., 3,789,976.

MTS Systems Corporation: *See—*
Meline, Harry R., 3,789,508.

Muchnick, Paul: *See—*
Lee, Sung Chuel; and Muchnick, Paul, 3,790,857.

Mucsi, Michael. Safety closure and container. 3,790,014, Cl. 215-9.000.

Mugschl, Eduard: *See—*
Horl, Erwin; Scholze, Peter; and Mugschl, Eduard, 3,790,781.

Muller, Daniel, to Nationale des Petroles d'Aquitaine. Process for the anionic polymerization of styrene. 3,790,547, Cl. 260-93.50r.

Muller, Hans: *See—*
Sommer, Reinhold, 3,790,185.

Muller, Herbert: *See—*
Posse, Rolf-Fred; Saleck, Wilhelm; Muller, Herbert; Randolph, August; and Moll, Franz, 3,790,386.

Muller, Joachim M.; and Triller, Adolf J., to Erwin Sick Optik-Elektronik. Single modulated light beam photometer. 3,790,290, Cl. 356-195.000.

Mullins, James N., Jr. Bagging apparatus and method. 3,789,570, Cl. 53-29.000.

Multi-Pro, Inc.: *See—*
Rudelick, John, 3,789,446.

Mund, Konrad; Richter, Gerhard; and Wenzel, Magdalena, to Siemens Aktiengesellschaft. Method for the manufacture of powdered tungsten carbide containing electrode material. 3,790,410, Cl. 136-122.000.

Munekata, Keniti: *See—*
Kurimoto, Mikishi; Munekata, Keniti; and Kamiya, Yoji, 3,789,501.

Munro, David Farnham: *See—*
Cuthbert, John David; McMahon, Richard George; and Munro, David Farnham, 3,790,287.

Munroe, Donald M., to Krawczyk, Charles C. Signal light. 3,790,937, Cl. 340-378.00r.

Muraca, Raffaele F., to Western Applied Research and Development Inc. Alkaline electrolytes for cells which provide efficient coulombic storage and transfer functions. 3,790,864, Cl. 317-231.000.

Murata Manufacturing Co., Ltd.: *See—*
Toyoda, Minoru, 3,790,840.

Murayama, Keisuke; Toda, Toshimasa; Mori, Eiko; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Watanabe, Ichiro, to Sankyo Company, Limited. 4-Piperidone ketal derivatives, their preparation and their use as stabilizers. 3,790,525, Cl. 260-45.8n.

Murayama, Naohiro; and Fukuda, Makoto, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for producing polyvinylidene fluoride polymethylmethacrylate compositions. 3,790,645, Cl. 260-884.000.

Murphy, John D. Flashlight and switch assembly. 3,790,912, Cl. 335-205.000.

Murray, David B.: *See—*
Porter, John H.; and Murray, David B., 3,789,667.

Murray, Kenneth M.; and Attix, Frank H., to United States of America, Navy. Absolute calorimetric dosimeter. 3,790,794, Cl. 250-352.000.

Murray, Lowell C.; and Hose, John M., to Container Corporation of America. Stackable package and method of making same. 3,790,019, Cl. 220-16.00r.

Murray, Malcolm G., Jr. Machine element alignment system. 3,789,507, Cl. 33-1.0sd.

Muslimer, Walter J., to Eastman Kodak Company. Precipitation of metal salts. 3,790,387, Cl. 96-94.000.

Musschoot, Albert, to General Kinematics Corporation. Vibratory vertical lift conveyor. 3,789,977, Cl. 198-220.0bc.

Muth, Karl: *See—*
Weyer, Rudi; Aumuller, Walter; Weber, Helmut; Muth, Karl; and Schmidt, Felix Helmut, 3,790,630.

Myers, Howard B.: *See—*

Jackson, Hewy E.; and Myers, Howard B., 3,790,353.
Nadella: *See—*
Pitner, Alfred, 3,790,240.
Nagai, Yasuhiro: *See—*
Kimura, Shinji; Fukui, Norihiro; and Nagai, Yasuhiro, 3,790,743.
Nagel, C. Rudolph. Pecan retriever. 3,790,202, Cl. 294-19.00a.
Nagoya, Itaru Niimi; Hashimoto, Kametaro; Ushitani, Kenzi; Serino, Yoichi; Mitani, Seishu; and Imanishi, Kunizo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Sintered alloy having wear resistance at high temperature. 3,790,352, Cl. 29-182.100.
Nagt, Elmer Andrew. Accumulator apparatus for lumber sorters. 3,789,980, Cl. 209-74.00r.
Nakahara, Akihiko: *See—*
Motani, Kensuke; Kiyotoshi, Tadahiro; and Nakahara, Akihiko, 3,790,535.
Nakajima, Fumio: *See—*
Nakano, Hiroshi; Takai, Hideo; and Nakajima, Fumio, 3,789,461.
Nakajima, Masa: *See—*
Kaneko, Eigi; and Nakajima, Masa, 3,790,455.
Nakamura, Masaya, to Kabushiki Kaisha Nakamura Seisakujo. Simulated bombing apparatus. 3,790,172, Cl. 273-101.200.
Nakanishi, Michio; Arimura, Katsuo; and Ao, Hideki, to Yoshitomi Pharmaceutical Industries, Ltd. 1-Oxa-2,4,8-triazaspiro (4,5) dec-2-enes. 3,790,579, Cl. 260-293.580.
Nakano, Hiroshi; Takai, Hideo; and Nakajima, Fumio, to Asahi Kasei Kogyo Kabushiki Kaisha. Apparatus for preparing spun yarn. 3,789,461, Cl. 19-.350.
Nakano, Masaki: *See—*
Aratani, Norio; and Nakano, Masaki, 3,789,467.
Nakashima, Yoshikatsu, to Kabushiki Kaisha Tokat Rika Denki Seisakusho. Device in an automobile for preventing an accidental locking of a steering shaft. 3,789,636, Cl. 70-252.000.
Nakata, Kunii; and Kubo, Yoshimasa, to Kabushiki Kaisha Akita and Kunii Nakata. Molding method with shielding member drawn against particulate material. 3,789,907, Cl. 164-7.000.
Nakayama, Northiko: *See—*
Owaki, Kenichi; Kiyozumi, Kentaro; and Nakayama, Northiko, 3,789,470.
Nalco Chemical Company: *See—*
Nielsen, Ralph R.; and Busler, William R., 3,790,477.
Spoerle, F. Steven; and Palmer, Elmer W., 3,790,476.
Naslund, Bengt Roland. Tool for mounting and dismounting a bolted union. 3,789,705, Cl. 81-13.000.
National Cash Register Company, The: *See—*
Bruckner, Ronald L., 3,790,818.
Janning, John L., 3,790,253.
National Recycling, Inc.: *See—*
Law, Edward; and Moore, James H., 3,790,091.
National Semiconductor Corporation: *See—*
Dobkin, Robert C., 3,790,817.
Nationale des Petroles d'Aquitaine: *See—*
Muller, Daniel, 3,790,547.
Neebel, Richard R.: *See—*
Doerfer, Richard E.; Leymaster, Homer N.; and Neebel, Richard R., 3,789,456.
Negrevergne, Georges, to Purdue Frederick, Company, The. Pyrazolidone derivatives substituted on the 4-position with pectin or algin. 3,790,558, Cl. 260-209.500.
Neier, Benjamin R., to B/J Manufacturing Co. Inc. Feed mixer. 3,790,138, Cl. 259-41.000.
Nemec, Joseph W.; and Schlaefer, Francis W., to Rohm & Haas Company. Catalyst and method of manufacture. 3,790,502, Cl. 252-439.000.
Nemoto, Tsuneo, to Sony Corporation. Tape and cassette for cleaning magnetic recording heads. 3,789,452, Cl. 15-210.00r.
Nemotoi, Isao, to Kabushiki Kaisha Suwa Seikosha and Day-date advancing structure for a timepiece. . 3,789,602, Cl. 58-58.000.
Nestor, Leonard R., to Minnesota Mining and Manufacturing Company. Self-tightening coupler. 3,790,292, Cl. 403-351.000.
Neufang, Karlheinz, to Siemens Aktiengesellschaft. Four-wire switching of junctions in tdm pcm switching centers under stored program control. 3,790,713, Cl. 179-15.0at.
Neugebauer, Heinz, to Werkzeugmaschinenfabrik Adolf Waldrich Coburg. Hydrostatic lubricating device for the meshes of cylinder worms and a worm rack. 3,789,956, Cl. 184-6.120.
Neumeister, Roger. Corn planter. 3,790,026, Cl. 221-211.000.
Nevin, C. Scott, to International Telephone and Telegraph Corporation. Image comparison tube and method of comparing radiation images. 3,790,844, Cl. 315-11.000.
New England Research Associates, Inc.: *See—*
Sims, John C., Jr., 3,790,055.
Newman, Jack: *See—*
Johnson, Alan J.; and Newman, Jack, 3,790,552.
Newman, Norman: *See—*
Fisch, Richard S.; and Newman, Norman, 3,790,381.
Newman, Peter M.; and Rowan, Daniel P. Light box assembly. 3,790,772, Cl. 240-10.00r.
Newmark, Louis, Limited: *See—*
Collomosse, Herbert; and Bacon, Patrick Albert Henry, 3,790,704.
Niagara Plastics, Inc.: *See—*
Rooney, James L., 3,790,046.
Nichi-Ber Blind Kogyo Kabushiki Kaisha: *See—*
Saito, Yasoji, 3,789,905.
Nichols, Charles: *See—*
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Moust, Daniel A., 3,789,846.
Nicholson, Denzel Allan, to Procter & Gamble Company, The. Process for the production of halogenated malonates. 3,790,622, Cl. 260-485.00h.
Niebylski, Leonard M.; and Jarema, Chester P., to Ethyl Corporation. Method of making metal foams by sequential expansion. 3,790,365, Cl. 75-20.00f.
Niebylski, Leonard M., to Ethyl Corporation. Aluminum-lead metal foams. 3,790,367, Cl. 75-20.00f.
Nielsen, Erik; and Pedersen, Hans Christian, said Pedersen assor. to Danfoss A/S. Electric connecting device for an encased refrigerating machine. 3,790,921, Cl. 339-125.00r.
Nielsen, Lawrence E.: *See—*
Lewis, Thomas B.; and Nielsen, Lawrence E., 3,790,438.
Nielsen, Ole Bent Tvaermose: *See—*
Feit, Peter Werner; and Nielsen, Ole Bent Tvaermose, 3,790,584.
Nielsen, Ralph R.; and Busler, William R., to Nalco Chemical Company. Latices for sewage coagulation. 3,790,477, Cl. 210-47.000.
Nihon Denshi Kabushiki Kaisha: *See—*
Ishijima, Hiroshi, 3,790,792.
Niimi, Itaru; Hashimoto, Kametaro; Ushitani, Kenzi; Serino, Yoichi; Ishihara, Ko; Mitani, Seishu; and Imanishi, Kunizo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Sintered alloy having wear resistance at high temperature. 3,790,351, Cl. 29-182.000.
Nilsson, Jan, to Allmanna Svenska Elektriska Aktiebolaget. Method for hydrostatic extrusion of tubes. 3,789,642, Cl. 72-60.000.
Nimylowycz, Osyp; and Lorenz, George, to United States of America, Army. Parachute arrangement. 3,790,113, Cl. 244-149.000.
Nippon Electric Company, Limited: *See—*
Tan, Yoichi; and Ryo, Toshihiko, 3,790,892.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Adachi, Takeshi, 3,790,693.
Okamoto, Misaku, 3,789,723.
Nippon Soda Co., Ltd.: *See—*
Tesaki, Kiyoshi; and Hiraoka, Michio, 3,790,528.
Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
Kurosaki, Teikichi; Odaka, Munehiko; and Hanaoka, Satoshi, 3,790,640.
Nischk, Gunther: *See—*
Christoph, Geert; Radlmann, Eduard; and Nischk, Gunther, 3,790,531.
Nishida, Sumio; and Kosa, Yasunobu, to Hitachi, Ltd. Insulated gate type field effect device and method of making the same. 3,789,503, Cl. 29-571.000.
Nissan Motor Company, Limited: *See—*
Enomoto, Koji; Ohtsuka, Kunio; and Ishimaru, Wataru, 3,789,863.
Nix, Thomas B., to Fuller Company. Removal of fluorides from gases. 3,790,143, Cl. 266-16.000.
Nja, Olav, to Kvernclands Fabrikk A/S. Plough beam with spring mechanism. 3,789,928, Cl. 172-709.000.
Noestheden, Andy B. Ressotint rocker. 3,789,704, Cl. 81-9.200.
Nordisk Ventilator Co. A/S: *See—*
Pedersen, Henry Valdemar; and Bredsted, Ole Jakobsen, 3,790,301.
Noren, Tore H.; and Federichi, George J. Visual automatic liquid feeder. 3,789,877, Cl. 137-590.000.
Norman Enterprises, Inc.: *See—*
Norman, William L., 3,790,790.
Norman, Vello, to Liggett & Myers, Incorporated. High flavor impact, low smoke yield cigarette mouthpiece. 3,789,855, Cl. 131-9.000.
Norman, William L., to Norman Enterprises, Inc. Polarity sensitive electronic switch and polarity indicator. 3,790,790, Cl. 250-211.00j.
Normann, Richard W., to Bendix Corporation, The. Coupling for an electrical connector. 3,790,922, Cl. 339-126.00r.
Norris Industries, Inc.: *See—*
Sanders, Vernard W.; and Fane, William J., 3,790,196.
Norris, John F.; and Humphreys, Donald R., to Custom Radius Corporation. Skate sharpening devices. 3,789,551, Cl. 51-92.00r.
North America Rockwell Corporation: *See—*
Dozier, Leonard C., 3,790,227.
North American Rockwell Corporation: *See—*
Gudmundsen, Richard A.; and Rau, James E., 3,790,898.
Miller, Darrow L., 3,789,656.
Northern Electric Company Limited: *See—*
Iyengar, Rama; and Zuber, Bretislav Paul, 3,789,480.
Schartmann, Knut Roger, 3,790,720.
Northrop, Richard Alfred, Jr.: *See—*
Wisyanski, Thomas William; and Northrop, Richard Alfred, Jr., 3,790,077.
Nottebohm, Harald: *See—*
Quietzsch, Gerhard; Greiner, Bernd; Hund, Helmut; Nottebohm, Harald; and Pelz, Lothar, 3,790,457.
Novak, Jiri, to Ceskoslovenska Akademie ved. Method of and apparatus for continuous electrochemical metering of substance concentrations in gaseous media, with electrolyte recirculation. 3,790,449, Cl. 204-1.00t.
Nozaki, Choji: *See—*
Komatsu, Noboru; Nozaki, Choji; Kurauchi, Toshio; and Sakai, Toshihiko, 3,790,208.
NRM Corporation: *See—*
Enders, George E., 3,789,712.
Oatey, Co.: *See—*

Kifer, David E., 3,790,038.

Oberly & Newell, Inc.: *See—*
Brand, Charles S., 3,789,778.

Obsomer, Marc, to Solvay & Cie. Plastic compositions based on poly(vinyl chloride) and containers manufactured therefrom. 3,790,644, Cl. 260-876.00r.

Odaka, Munehiko: *See—*
Kurosaki, Teikichi; Odaka, Munehiko; and Hanaoka, Satoshi, 3,790,640.

O'Donnell, Dennis Joseph: *See—*
Gill, Peter John; and O'Donnell, Dennis Joseph, 3,789,726.

Oesterreichische Studiengesellschaft fur Alomenergie Gesellschaft m.b.H.: *See—*
Horl, Erwin; Scholze, Peter; and Mugschl, Eduard, 3,790,781.

Oetiker, Hans. Bridging member for hose clamps. 3,789,463, Cl. 24-20.0cw.

Office National d'Etudes et de Recherches Aerospatiales: *See—*
Brejaud, Hubert P., 3,789,653.

Oga, Shunichiro; Sato, Kiyoshi; Imada, Katsumi; and Asano, Kazuo, to Daiechi Seiyaku Co., Ltd. Process for preparing diketogluconic acid. 3,790,444, Cl. 195-47.000.

Ogawa, Kinya: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; Ogawa, Kinya; and Shimizu, Toshihide, 3,790,542.

Ogiso, Mitsutoshi; Shikawa, Kazuo; and Shigeta, Yoshihiro, to Canon Kabushiki Kaisha. Audio-visual apparatus. 3,790,265, Cl. 353-19.000.

Ogle, James A.: *See—*
Doane, John C.; Holz, George E.; Ogle, James A.; and Samlyody, Arpod, 3,790,850.

Ohashi, Hiroaki: *See—*
Shinohara, Hiroyuki; Ohashi, Hiroaki; and Konno, Kazuhiko, 3,790,626.

Ohasi, Mitsuo: *See—*
Irikura, Tsutomu; Kasuga, Kazunori; Hashizume, Taeko; Ohasi, Mitsuo; Yuge, Masuo; and Yamada, Michiko, 3,790,586.

Ohba, Shunjiro: *See—*
McCormick, James B.; and Ohba, Shunjiro, 3,790,042.

Ohishi, Tetsu; Fukushima, Hiroshi; and Fukuda, Hideo. Oil-resistant polymer composition. 3,790,646, Cl. 260-894.000.

Ohsawa, Mitsuo, to Sony Corporation. FM stereophonic receiver. 3,790,714, Cl. 179-15.0bt.

Ohta, Noriyuki: *See—*
Murayama, Keisuke; Toda, Toshimasa; Mori, Eiko; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Watanabe, Ichiro, 3,790,525.

Ohtsuka, Kunio: *See—*
Enomoto, Koji; Ohtsuka, Kunio; and Ishimaru, Wataru, 3,789,863.

Oishi, Yashushi; Yoshida, Yoshinobu; and Sano, Kazuya, to Fuji Photo Film Company, Ltd. Light-sensitive color photographic elements with improved image quality. 3,790,384, Cl. 96-74.000.

Oishi, Yasushi; Sano, Kazuya; and Yoshida, Yoshinobu, to Fuji Photo Film Company, Ltd. Color photographic light-sensitive elements with both colored and colorless color couplers. 3,790,379, Cl. 96-55.000.

Ojima, Shin; and Sano, Hiroshi, to Hoshi Denki Seizo Kabushiki Kaisha. Sterophony-simulating earphone. 3,790,711, Cl. 179-1.0gp.

Okada, Hiroyoshi: *See—*
Fikutani, Hideo; Tokizawa, Makoto; and Okada, Hiroyoshi, 3,790,532.

Okamoto, Misaku, to Nippon Gakki Seizo Kabushiki Kaisha. Group training system for electronic musical instruments. 3,789,723, Cl. 84-470.000.

Okazaki, Mitsutoshi: *See—*
Sone, Maso; Okazaki, Mitsutoshi; and Ueyama, Yasuomi, 3,790,434.

Okonite Company, The: *See—*
Buckingham, Robert P., 3,790,697.

Okumura, Akio: *See—*
Shiba, Keisuke; Sano, Kazuya; Okumura, Akio; and Kubodera, Seiiti, 3,790,388.

Okumura, Munehiro: *See—*
Sato, Hiroshi; Okumura, Munehiro; and Arita, Masujiro, 3,790,497.

Okusut, Eiichi: *See—*
Shimamura, Isao; Okusut, Eiichi; Iijima, Yoo; and Iwano, Haruhiko, 3,790,383.

Oldham, Robert R.; and Wooddell, John H., to Oldham, Robert R., Inc. Pivotable fluid diverter for recirculation system. 3,789,986, Cl. 210-121.000.

Oldham, Robert R., Inc.: *See—*
Oldham, Robert R.; and Wooddell, John H., 3,789,986.

Olin Corporation: *See—*
Boston, Denis R., 3,789,734.
Ford, James A., 3,789,915.

Oliver, Leland W.: *See—*
Brancaleone, Salvatore T.; and Oliver, Leland W., 3,790,858.

Olivetti, Ing., C., & C., S.p.A.: *See—*
Pagella, Elto; and Ollearo, Georgio, 3,789,473.

Ollearo, Georgio: *See—*
Pagella, Elto; and Ollearo, Georgio, 3,789,473.

Olsen, Dick Merlin, to Clayton Manufacturing Company. Engine performance analyzer. 3,789,658, Cl. 73-117.300.

Olsson, Robert G.; and Turkdogan, Ethem T., to United States Steel Corporation. Method for enhancing the removal of volatile species from liquids. 3,790,368, Cl. 75-49.000.

Olsson, Robert G.; and Turkdogan, Ethem T., to United States Steel Corporation. Method for enhancing the reaction of a species of a liquid with a fluid substance. 3,790,369, Cl. 75-49.000.

Omark Industries, Inc.: *See—*
Kohart, Ralph A., 3,789,490.

Omron Tatesis Electronics Co.: *See—*
Tanimura, Shigeru; Miura, Nobuaki; Asano, Usamu; and Yamamura, Nobuyuki, 3,790,869.

O'Neill, Richard J.; Blaker, Gene M.; Manthei, Edward C.; and Ronk, Elmer L., to Impact Registers, Inc. Apparatus for measuring and recording acceleration forces. 3,790,951, Cl. 346-7.000.

Onishi, Akira; Irako, Koichi; Hayakawa, Yoshihiro; Shimomura, Takeshi; Kawagoi, Takahiro; and Miyamoto, Shoji, to Bridgestone Tire Company, Limited. Method of producing of alternating copolymers of conjugated dienes and conjugated polar vinyl monomers. 3,70,539, Cl. 260-80.700.

Ono, Natsumi: *See—*
Tanigawa, Shizuhiko; Ishikawa, Shinzaburo; and Ono, Natsumi, 3,790,758.

Oravitz, James L.: *See—*
Dahlberg, John R.; ; Oravitz, James L.; and Michalik, Edmund R., 3,790,362.

Oravitz, James L., Jr.: *See—*
Dahlberg, John R.; Oravitz, James L., Jr.; and Michalik, Edmund R., 3,790,054.

Oreli, John D.: *See—*
Montgomery, Marshall A.; Thier, Herbert D.; and Oreli, John D., 3,789,519.

Orfei, John B., to American Science & Engineering, Inc. Educational observatory. 3,789,799, Cl. 119-15.000.

Orlando, Daniel, to Globe-Union Inc. Method for fabricating a threaded stud in a battery post. 3,790,741, Cl. 219-102.000.

Orlomoski, Roger W., to Litton Industrial Products, Inc. Dies for making self-locking threads. 3,789,644, Cl. 72-469.000.

Ort, Wolfgang: *See—*
Hopfner, Clemens; and Ort, Wolfgang, 3,790,268.

Ortho Pharmaceutical Corporation: *See—*
Luciano, Robert A.; Zmijewski, Chester M.; and Borden, Gustav V., 3,790,048.

Orvis, Gary W., to Du Pont de Nemours, E. I., and Company. Process for preparing acrylic organosol coating compositions. 3,790,523, Cl. 260-30.60r.

Osenberger, Werner: *See—*
Fuelling, Wolfgang; and Osenberger, Werner, 3,790,234.

Oshima, Akio; Oshima, Hiroshi; and Kombashiri, Takamichi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Methylation of phenols at ortho-position. 3,790,641, Cl. 260-621.00r.

Oshima, Hiroshi: *See—*
Oshima, Akio; Oshima, Hiroshi; and Kombashiri, Takamichi, 3,790,641.

Ostand, Paul R.; and Guertin, Robert W., to Dover Corporation. Single point refueling nozzle. 3,790,126, Cl. 251-89.500.

Oster, Lloyd Robert, to General Electric Company. Dynamic biasing arrangement for speed regulation. 3,790,778, Cl. 246-182.00c.

Osterreichische Stickstoffwerke Aktiengesellschaft: *See—*
Diskus, Alfred; Schonbeck, Rupert; Kloimstein, Engelbert; and Mayr, Hubert, 3,790,571.

Otto, Dennis L., to Timken Company, The. Bearing seal assembly. 3,790,238, Cl. 308-187.100.

Outboard Marine Corporation: *See—*
Jespersen, Herbert A., 3,790,230.
Rose, Edgar, 3,790,231.

Outokumpu Iy: *See—*
Bryk, Petri B.; Honkasalo, Jorma B.; Malmstron, Rolf E.; Makipirtti, Simo A. I.; Toivanen, Toivo A.; and Aaltonen, Olavi A., 3,790,366.

Overly Manufacturing Company: *See—*
Flanigan, Charles Dennis, 3,790,164.

Owaki, Kenichi; Kiyozumi, Kentaro; and Nakayama, Northiko, to Fujitsu Limited. Method of manufacture of display device utilizing gas discharge. 3,789,470, Cl. 29-25.130.

Owen, Robert E., to General Motors Corporation. Height control valve for air spring with end piston-boot operated. 3,790,147, Cl. 267-65.00b.

Owen, Thomas G., Jr. Pivotable refuse cart dumping apparatus with horizontally movable and spreadable arms. 3,790,011, Cl. 214-302.000.

Owens, Carl D.: *See—*
Tam, George M.; Gardner, Delbert J.; Grabe, Frederick G.; Putt, James B.; Owens, Carl D.; and Sisco, William C., 3,789,735.

Owens-Illinois, Inc.: *See—*
Banyas, John D.; and Ross, Edward A., 3,790,087.
Senesky, Albert P., 3,789,983.

Paaskesen, Julius Barclay Estrup. Toaster. 3,789,749, Cl. 99-391.000.

Packaging Corporation of America: *See—*
Boyd, James W., 3,790,062.

Paddison, Denys Ian, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for the Environment in her Britannic Majesty's Government of the. Vehicle control apparatus. 3,790,779, Cl. 246-182.00c.

Padovani, Piero; and Boerio, Sergio, to Pyronics, Inc. Infra-red burner. 3,790,333, Cl. 431-266.000.

Pagella, Elto; and Ollearo, Georgio, to Olivetti, Ing., C., & C., S.p.A. Machine tool having automatic means for tool-change. 3,789,473, Cl. 29-568.000.

Paillard S.A.: *See—*
Costa, Georges, 3,789,970.

Paladino, Dick. Oboe fingering system and mouthpiece. 3,789,721, Cl. 84-380.00a.

Palfi, Thomas L.; Brooks, Charles; and Miller, George J., to Advanced Memory Systems, Inc. Random access dynamic semiconductor memory system. 3,790,961, Cl. 340-173.0dr.

Palisin, Stephen P., Jr., to Empire Plating Company, The. Coated metal article and method of coating. 3,790,355, Cl. 29-195.000.

Palmer, Elmer W.: *See—*
Spoerle, F. Steven; and Palmer, Elmer W., 3,790,476.

Palmer, Osmond F.: *See—*
Huboi, Robert W.; Palmer, Osmond F.; and Waz, Edward M., 3,790,275.

Palombo, Gaston A.: *See—*
Deyesso, Joseph P.; and Palombo, Gaston A., 3,789,971.

Palsson, Jan Frederik: *See—*
Martensson, Kjell Halvard; Linda, Bjorn Hison; Palsson, Jan Frederik; and Jerrf, Sven Torsten, 3,789,746.

Pampus, Gottfried: *See—*
Maertens, Dieter; Lehnert, Gunther; and Pampus, Gottfried, 3,790,544.
Schon, Nikolaus; Pampus, Gottfried; and Witte, Josef, 3,790,546.

Pankove, Jacques Isaac, to RCA Corporation. Semiconductor light ray deflector. 3,790,853, Cl. 317-235.00r.

Pantke, Hellmuth: *See—*
Frickenhaus, Gerrit; Meister, Martin; Pantke, Hellmuth; and Schuffenhauer, Erhard, 3,790,344.

Panzer, Hans Peter; and McAdams, Louis Vincent, to American Cyanamid Company. Polymers containing cyclo-1,1-diallylguanidine linkages and wet strength paper having a content thereof. 3,790,537, Cl. 260-80.30n.

Pao, Yoh-Han, to Case Western Reserve University. Light controlled light beam defector. 3,790,252, Cl. 350-160.00r.

Paolini, Frank; and Kuhnel, Alfred, to American Science & Engineering, Inc. Radiographic imaging. 3,790,785, Cl. 250-363.000.

Papp, Alexander A.: *See—*
MacFarland, Charles H.; and Papp, Alexander A., 3,789,449.

Parke Davis & Company: *See—*
De Wald, Horace A., 3,790,576.

Parker Hannifin Corporation: *See—*
Kempton, Calvin E.; and Reinicke, Robert H., 3,789,876.

Parker, Rollin James, to General Electric Company. Magnetic latch. 3,790,197, Cl. 292-251.500.

Parker-Hannifin Corporation: *See—*
Scannell, John B., 3,790,179.

Parmeson, Joseph. Activator for fishing lures. 3,789,536, Cl. 43-42.500.

Parsons, John T. Meltable matrix chucking apparatus. 3,790,152, Cl. 269-7.000.

Paschenko, Nikolai Evgenievich: *See—*
Kozlovsky, Anatoly Avgustinovich; Paschenko, Nikolai Evgenievich; Polyakov, Vladimir Grigorievich; and Kogan, Iosif Yakovlevich, 3,789,997.

Pascher, Robert L., to Textron, Inc. Tail rotor mounting for coning relief. 3,790,302, Cl. 416-134.000.

Pasky, Joseph Z., to Chevron Research Company. Carboxylic, hydroxy-carboxylic and related acid mixtures. 3,790,609, Cl. 260-413.000.

Passeri, David P., to Bendix Corporation, The. Fluid analyzer. 3,789,655, Cl. 73-24.000.

Passman, John W. Shirt pocket refrigeration gauge. 3,789,669, Cl. 73-419.000.

Patel, Jayant K., to TRW Inc. Motor-tachometer. 3,790,832, Cl. 310-113.000.

Paterson, Arthur R.; and Reimschuessel, Annemarie C. Process for preparing fiberboard having improved dimensional stability. 3,790,417, Cl. 156-62.800.

Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georievich, to Institut Elektrosvarki Im. E. O. Patona. Method for electroslag remelting of consumable electrodes. 3,790,691, Cl. 13-9.000.

Paul, Alfred L.: *See—*
Sels, Wally O.; and Paul, Alfred L., 3,790,121.

Paul, Dwight D., Jr., to M.S.C. Inc., mesne. Conveyor. 3,789,976, Cl. 198-219.000.

Paul, Leon F.: *See—*
Matier, Robert C.; and Paul, Leon F., 3,789,910.

Pauls, Charles W., to Cessna Aircraft Company, The. Valve detent mechanism. 3,790,129, Cl. 251-297.000.

Pavlovichavdely, Mikhail: *See—*
Brusakov, Jury Ivanovich; Sirotkin, Nikolai Nikolaevich; Kiselev, Vasily Pavlovich; Ilinkov, Dmitry Vladimirovich; Pavlovichavdely, Mikhail; Marin, Semen Panteleevich; Shkarupa, Alexandr Ivanovich; Veisman, Boris Ottovich; Lebedev, Vladimir Nikolaevich; an Gavrilenko, Nikolai Pavlovich, 3,790,692.

Pazis, Thomas: *See—*
Bernstein, Barry E.; Erbstein, Robert S.; and Pazis, Thomas, 3,789,595.

Peabody Engineering Corporation: *See—*
Arnold, Orlan M.; and Vancini, Carlo A., 3,789,585.
Arnold, Orlan M.; and Vancini, Carlo A., 3,789,586.

Pearl, David R.: *See—*
Gerber, Heinz Joseph; and Pearl, David R., 3,790,154.

Pearl, David R., to Gerber Garment Technology, Inc. Device for cutting sheet material. 3,789,716, Cl. 83-747.000.

Pearson, Walter C.; Quinn, Edward P.; and Thompson, Dorman N., to Minnesota Mining and Manufacturing Company. Apparatus for producing prefabricated bows. 3,790,041, Cl. 223-46.000.

Pedersen, Hans Christian: *See—*
Nielsen, Erik; and Pedersen, Hans Christian, 3,790,921.

Pedersen, Hans Kristian: *See—*
Romer, Bendt Wegge; and Pedersen, Hans Kristian, 3,790,308.

Pedersen, Henry Valdemar; and Bredsted, Ole Jakobsen, to Nordisk Ventilator Co. A/S. Axial flow fan, the impeller vanes of which are adjustable during operation. 3,790,301, Cl. 416-108.000.

Pegard, Pierre, to Ateliers G.S.P. (Guillemin, Sergot, Pegard). Device for automatically changing tools. 3,789,472, Cl. 29-568.000.

Peisker, Glenn W.: *See—*
Heyn, William O.; and Peisker, Glenn W., 3,790,180.

Pekau, Dietlind, to Siemens Aktiengesellschaft. Method for determining the speed of a vehicle. 3,790,926, Cl. 340-3.00r.

Pelam, Inc.: *See—*
McCormick, James B.; and Ohba, Shunjiro, 3,790,042.

Pelino, William M., to Railtorn Corporation. Indicator for overheated bearings. 3,790,777, Cl. 246-109.00a.

Pelz, Lothar: *See—*
Quietzsch, Gerhard; Greiner, Bernd; Hund, Helmut; Nottebohm, Harald; and Pelz, Lothar, 3,790,457.

Pelzel, Erich, to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft. Alloy on aluminum-zinc-basis. 3,790,373, Cl. 75-146.000.

Pennwalt Corporation: *See—*
Bross, Charles Frederick, 3,789,575.
Dohany, Julius Eugene; and Whiton, Alfred Case, 3,790,540.

Pentegov, Igor Vladimirovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georievich, 3,790,691.

Peoples, John R., to United States of America, Navy. Rotating fin. 3,790,103, Cl. 244-3.230.

Pepro Societe pour le Development et la Vente de Specialites Chimiques: *See—*
Demozay, Daniel; Pillon, Daniel; and Ducret, Jacques, 3,790,582.

Perkin-Elmer Corporation, The: *See—*
Chamran, Morteza, 3,790,819.

Peroni, George J., to Seatech Corporation. Body seal for underwater device. 3,789,788, Cl. 114-16.00a.

Perrin, Robert L.: *See—*
Schwarzbach, Peter H.; and Perrin, Robert L., 3,789,708.

Perronnet, Jacques; and Demoute, Jean-Pierre, to Roussel-UCLAF. Substituted diamino-s-triazines. 3,790,570, Cl. 260-249.800.

Pesce, Louis. Dental floss. 3,789,858, Cl. 132-89.000.

Peter, Arnold, to Ruti Machinery Works, Ltd.; formerly Caspar Honegger, Ruti Zurich. Arrangement for reciprocating a weft inserter rod. 3,789,887, Cl. 139-123.000.

Peterli, Hans Jakob: *See—*
Dexter, Martin; Knell, Martin; and Peterli, Hans Jakob, 3,790,597.

Peters, Frank Groom; and Schwartz, Newton. Thin film resistor comprising sputtered alloy of silicon and tantalum. 3,790,913, Cl. 338-308.000.

Peters Machinery Company: *See—*
Talbot, Richard C.; Rose, Edward; and Roth, Robert A., 3,789,964.

Peters, Philip H., Jr., to Environment/One Corporation. Inductive heated bake oven. 3,790,735, Cl. 219-10.490.

Peters, Rudolf, to Windmoller & Holscher. Apparatus for slitting seamless flattened tubes of plastics film. 3,789,713, Cl. 83-184.000.

Petersdorf, Gerhard: *See—*
Knechiel, Wilhelm; Petersdorf, Gerhard; and Sandner, Winfried, 3,790,272.

Peterson Manufacturing Company: *See—*
Peterson, Walter R., 3,790,216.

Peterson, Walter R., to Peterson Manufacturing Company. Wedge locking wheel mounting. 3,790,216, Cl. 301-1.000.

Petit, Maurice; and Thomas, Georges, to Ets J.J. Carnaud & Forges de Basse-Indre. Sterilisation of tins. 3,789,785, Cl. 113-1.00g.

Petrick, John T., to United States of America, Navy. Device to prevent accidental ignition of electro-explosives from electrostatic discharge. 3,789,762, Cl. 102-28.00r.

Petrocci, Alfonso N.: *See—*
Merianos, John J.; Shay, Edward Griffin; Adams, Phillip; and Petrocci, Alfonso N., 3,790,678.

Petty Geophysical Engineering Company: *See—*
Mayne, William Harry; and Crump, Thomas R., 3,790,929.

Pfaff & Kendall: *See—*
Pfaff, Henry C., Jr.; and Bowser, Wenard, Jr., 3,790,814.

Pfaff, Henry C., Jr.; and Bowser, Wenard, Jr., to Pfaff & Kendall. Electrical lowering apparatus. 3,790,814, Cl. 307-119.000.

Pfanmueller, Helmut: *See—*

Trieschmann, Hans-Georg; Pfanmueller, Helmut; and Zeitler, Gerhard, 3,790,548.

Pfannkuche, Hubert: *See—*
Hoffmann, Hans-Juergen; Loehr, Manfred; and Pfannkuche, Hubert, 3,790,146.

Pfizer Inc.: *See—*
Butler, Kenneth, 3,790,620.

Pforzkeimer Uhren-Rohwerke Inh.: *See—*
Uhrentechniker, Alfred Eisele, 3,789,603.

Phelps Dodge Magnet Wire Corporation: *See—*
Koerner, Ernest C.; Wareham, William W.; and Bisque, Donny R., 3,790,530.

Philco-Ford Corporation: *See—*
White, Matthew B.; and Gerber, Wesley Duane, 3,790,901.

Philips, Walter John; and Liddall, Jack Anthony. Automatic therapeutic ventilator. 3,789,837, Cl. 128-145.800.

Phillips, Duncan Adrian Sidney: *See—*
Cheetham, Ian; Dunkerley, Kenneth; Greenhalgh, Colin William; and Phillips, Duncan Adrian Sidney, 3,790,604.

Phillips Petroleum Company: *See—*
Hudson, Jimmie E.; and Snelson, Jimmy W., 3,790,319.
Jones, Faber B., 3,790,423.
Knief, Chester L., 3,789,922.
Kraus, Gerard, 3,790,286.
Roland, Charles H., 3,790,330.
Shofner, Don L.; Robinson, Leroy E.; and Martinovich, Robert J., 3,789,754.
Vidaurri, Fernando C., Jr., 3,790,536.
Walker, Darrell W., 3,790,500.
Walker, Darrell W., 3,790,501.

Phillips, Willis Paul. Sighting and relating device for X-ray tube head. 3,790,803, Cl. 250-490.000.

Photographic Sciences Corporation: *See—*
Van Derwater, Glen A., Jr., 3,790,262.

Phykitt, Howard P.: *See—*
Webb, Geoffrey A. M.; and Phykitt, Howard P., 3,790,784.

Pichon, Jacques: *See—*
Valiboose, Bernard; and Pichon, Jacques, 3,789,988.

Pickart, Don E.: *See—*
Merten, Ronald A.; and Pickart, Don E., 3,790,407.

Picker Corporation: *See—*
Foderaro, Anthony J., 3,790,805.

Pickering, Royce Dean, to Eastman Kodak Company. X-Y optical scanning system. 3,790,246, Cl. 350-7.000.

Pickles, Sidney; and Thornberg, Dean S., to E-Systems, Inc. Radio frequency antenna system. 3,790,943, Cl. 343-106.00r.

Pierce, Bernard N., to Merrow Machine Company, The. Alignment means and method. 3,790,236, Cl. 308-23.000.

Pierce, Victor Joel: *See—*
Prussin, Samuel Benjamin; and Pierce, Victor Joel, 3,790,031.

Pierdet, Andre; and Azadian, Genevieve, to Roussel-UCLAF. Trienic steroids, process of their preparation and methods of their use. 3,790,564, Cl. 260-239.55c.

Pignato, James M. Reusable container. 3,790,061, Cl. 229-2.500.

Piguet, Paul: *See—*
Quaile, Henri; and Piguet, Paul, 3,790,237.

Pilkington Brothers Limited: *See—*
Lawrenson, Jack, 3,790,361.

Pillon, Daniel: *See—*
Demozay, Daniel; Pillon, Daniel; and Ducret, Jacques, 3,790,582.

Pinkerton, James David. Dual combustion process for an internal combustion engine. 3,789,807, Cl. 123-1.00r.

Pitchon, Esra; and Earle, Ernest L., Jr., to General Foods Corporation. Extraction of roasted and ground coffee. 3,790,689, Cl. 426-434.000.

Pitner, Alfred, 1/2 to Nadella. Rolling bearing assembly with a reduced operational clearance. 3,790,240, Cl. 308-207.000.

Pittman, Clarence E.: *See—*
Martin, Roy A.; and Pittman, Clarence E., 3,790,073.

Plastic Tubing, Inc.: *See—*
Maroschak, Ernest J., 3,789,615.

Plati, John Thomas: *See—*
Albrecht, Harry Allen; and Plati, John Thomas, 3,790,591.

Plempel, Manfred: *See—*
Boshagen, Horst; and Plempel, Manfred, 3,790,587.
Meiser, Werner; Metzger, Carl; Buchel, Karl Heinz; and Plempel, Manfred, 3,790,594.

Plexowood, Inc.: *See—*
Habgood, Robert P., Jr., 3,790,421.

Plice, William A., to United States of America, Navy, mesne. Force balance pressure device. 3,789,758, Cl. 102-13.000.

Plizak, Bruno T.: *See—*
Saltzman, Alvin R.; and Plizak, Bruno T., 3,790,486.

Pochard, Michel Adrien, to Etablissements Carpano & Pons S.A. Sprinkler. 3,790,082, Cl. 239-240.000.

Podola, Nikolai Vasilievich: *See—*
Lipshits, Viktor Senderovich; Andrianov, Vladimir Rubenovich; Rykalin, Nikolai Nikolaevich; Krasnev, Tibor Ferentsevich; Podola, Nikolai Vasilievich; and Krivonos, Vadim Petrovich, 3,790,739.
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Pentegov, Igor Vladimirovich; Latash, Jury Vadimovich; Bondarenko, Oleg Petrovich; Baglai, Vitaly Mikhailovich; Podola, Nikolai Vasilievich; and Emelyanenko, July Georievich, 3,790,691.

Podschus, Ernst, to Bayer Aktiengesellschaft. Process for the manufacture of colloidal fibrous doehmite. 3,790,495, Cl. 252-313.00r.

Pohl, Karl-Heinz, to Bell Telephone Laboratories, Incorporated. Contact spring and switch construction. 3,790,733, Cl. 200-166.00j.

Polar Ware Company: *See—*
Vollrath, Walter J., Jr.; Vollrath, Richard J.; Virnoche, Paul R.; Turk, Joseph; Gerdes, Paul E.; and Singer, Roy W., 3,789,434.

Polidor, Edward C., to Automation Gages, Incorporated. Antifriction slide assembly. 3,790,233, Cl. 308-6.00r.

Polinski, Raymond E.: *See—*
Miller, William G.; and Polinski, Raymond E., 3,789,641.

Polucci, Gerald: *See—*
Stein, Jay A.; and Polucci, Gerald, 3,790,799.

Polyakov, Vladimir Grigorievich: *See—*
Kozlovsky, Anatoly Avgustinovich; Paschenko, Nikolai Evgenievich; Polyakov, Vladimir Grigorievich; and Kogan, Iosif Yakovlevich, 3,789,997.

Polymer Corporation Limited: *See—*
Feniak, George, 3,790,549.

Portec, Inc.: *See—*
Broling, Keith W.; and Tatina, Richard A., 3,789,775.

Porter, John H.; and Murray, David B., to Ladd Research Industries, Inc. Fiber optic pressure detector. 3,789,667, Cl. 73-406.000.

Portescap: *See—*
Quaile, Henri; and Piguet, Paul, 3,790,237.

Portinari, Antonio, to Industrie Pirelli Societa per Azioni. Filled telephone cable with bonded screening layer. 3,790,694, Cl. 174-23.00r.

Posse, Rolf-Fred; Saleck, Wilhelm; Muller, Herbert; Randolph, August; and Moll, Franz. Process for the production of silver halide dispersions. 3,790,386, Cl. 96-94.00r.

Pozzi, Jean-Pierre, to La Trombe. Flushing system. 3,789,432, Cl. 4-26.000.

PPG Industries, Inc.: *See—*
Coleman, George E., 3,790,801.
Dahlberg, John R.; Oravitz, James L., Jr.; and Michalik, Edmund R., 3,790,054.
Dahlberg, John R.; ; Oravitz, James L.; and Michalik, Edmund R., 3,790,362.

Prag, Rudolf: *See—*
Friel, Hanns-Immo; Prag, Rudolf; and Schlichting, Heidi, 3,790,786.

Prameta Prazisionsmetall- und Kunststofferzungnisse G. Baumann & Co.: *See—*
Grunert, Hellmuth, 3,790,295.

Prappier, Robert H.; Tanner, Hal W., Jr.; and Wagers William O., to International Paper Company. Method and apparatus for edge sealing corrugated paperboard. 3,790,399, Cl. 117-44.000.

Prayfel Inc.: *See—*
Chevalier, Paul; Menard, Claude; and Dorval, Bertrand, 3,790,768.

Prelisauer, Peter: *See—*
Wiedenmann, Konrad; and Prelisauer, Peter, 3,789,786.

Price, Robert T., to General Motors Corporation. Vacuum control for carburetor power enrichment apparatus. 3,789,702, Cl. 74-859.000.

Price, William R. Pressurized fuel tank support for vehicles. 3,790,183, Cl. 280-5.00a.

Price's Patent Candle Company, Limited: *See—*
Woollard, Ronald Brian, 3,790,332.

Pringle, Frank E., Jr.: *See—*
James, Robert C.; Wilson, David A.; and Pringle, Frank E., Jr., 3,789,888.

Procter & Gamble Company, The: *See—*
Damico, Ralph A.; and Laughlin, Robert G., 3,790,598.
Jones, Jack D.; and Collier, Everett J., 3,790,482.
Nicholson, Denzel Allan, 3,790,622.

Production, Inc.: *See—*
Schmidt, Gunter, 3,790,160.

Provan, David: *See—*
Black, Robert; Provan, David; and Rainey, Christopher, 3,790,754.

Province, William F., to Ridge Tool Company, The. Hydraulic actuated fusion unit for plastic pipe. 3,789,493, Cl. 29-282.000.

Prquignot, Michel, to Commissariat a l'Energie Atomique and Societe pour l'Application des Hautes Temperatures (Quartex). Method of fabrication of a composite product made up of at least two components having different compositions. 3,789,499, Cl. 29-472.90.

Prussin, Samuel Benjamin; and Pierce, Victor Joel. Method of control for aerosol dispensing and multiphase aerosol dispenser. 3,790,031, Cl. 222-136.000.

Puli, Albert A.: *See—*
Bussart, Clayton J.; and Puli, Albert A., 3,790,348.

Pullman Incorporated: *See—*
McNally, George S.; Brinks, Floyd J.; and Lee, Sang H., 3,789,773.
Tamborski, Robert S., 3,789,999.

Purcell, Albert L.: *See—*
Walter, William M., Jr.; and Purcell, Albert L., 3,790,688.

Purdue Frederick, Company, The: *See—*
Negrevergne, Georges, 3,790,558.

Putt, James B.: *See—*
Tam, George M.; Gardner, Delbert J.; Grabe, Frederick G.; Putt, James B.; Owens, Carl D.; and Sisco, William C., 3,789,735.

Pyronics, Inc.: *See—*
Padovani, Piero; and Boerio, Sergio, 3,790,333.

Quaile, Henri; and Piguet, Paul, to Portescap. Elastic pivot bearing. 3,790,237, Cl. 308-159.000.

Quaker Oats Company, The: *See—*
Brindell, Gordon D.; and Macander, Rudy F., 3,790,526.
Spengler, Duane E.; and Bartoo, Charles O., 3,789,538.

Quattlebaum, Walter J.: *See—*
Young, William O., Jr.; and Quattlebaum, Walter J., 3,790,424.

Quietzsch, Gerhard; Greiner, Bernd; Hund, Helmut; Nottebohm, Harald; and Pelz, Lothar, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for adjusting the electrode distance in an electrolytic cell with flowing mercury cathoe. 3,790,457, Cl. 204-99.000.

Quinn, Edward P.: *See—*
Pearson, Walter C.; Quinn, Edward P.; and Thompson, Dorman N., 3,790,041.

Quinn, Gerald L. Tractor mounted hydraulic posthole digger. 3,789,931, Cl. 173-22.000.

Raab, Andrew F.; and Schaad, William J., to Indak Manufacturing Corporation. Alternate action switch with sealing giving visual indication of switch position. 3,790,734, Cl. 200-168.00g.

Radiant Energy Systems, Inc.: *See—*
Longamore, Robert Gail, 3,790,155.

Radiant Energy Systems, Inc., mesne: *See—*
Moore, Arthur H., 3,790,051.

Radlmann, Eduard: *See—*
Christoph, Geert; Radlmann, Eduard; and Nischk, Gunther, 3,790,531.

Radu, Gheorghe; and Aldea, Alexandru. Walking system for paraplegics. 3,790,187, Cl. 280-11.200.

Rae, Jerry W.; and White, Dean S., to American Standard, Inc. Edge seals for multiple-interfitting partitions. 3,789,567, Cl. 52-582.000.

Ragnow, Richard W., to Funforms Inc. Puzzle ball. 3,790,175, Cl. 273-160.000.

Railtorn Corporation: *See—*
Pelino, William M., 3,790,777.

Railway Engineering Associates, Inc.: *See—*
List, Harold A., 3,789,770.

Rainey, Christopher: *See—*
Black, Robert; Provan, David; and Rainey, Christopher, 3,790,754.

Raj, Joachim: *See—*
Strohmer, Alfred; and Raj, Joachim, 3,789,769.

Rakocy, William J.: *See—*
Rappoport, Seymour; and Rakocy, William J., 3,789,748.

Raleigh Industries, Limited: *See—*
Barwell, Ian John, 3,789,475.

Raleigh, Walter J., to Graco Inc. Air motor noise suppressor. 3,789,954, Cl. 181-33.00k.

Raleigh, William J., to General Electric Company. Organopolysiloxane copolymer useful as surfactant. 3,790,612, Cl. 260-448.20b.

Rambauske, Werner R.: *See—*
Goldstein, Irving; and Rambauske, Werner R., 3,790,257.

Rambauske, Werner R., to Raytheon Company. Steerable catoptric lens arrangement. 3,790,258, Cl. 350-294.000.

Ramberg, Edward G. RCA Corporation Optical system for orthogonalizing image field of projection lens. 3,790,267, Cl. 353-70.000.

Ramsey, William W.: *See—*
Thompson, Lee E.; and Ramsey, William W., 3,789,733.

Ramsey Winch Co.: *See—*
Thompson, Lee E.; and Ramsey, William W., 3,789,733.

Rand, Robert B. Clothing having adjustable belt loops. 3,789,431, Cl. 2-236.000.

Randolph, August: *See—*
Posse, Rolf-Fred; Saleck, Wilhelm; Muller, Herbert; Randolph, August; and Moll, Franz, 3,790,386.

Randomatic Data Systems, Inc.: *See—*
Cross, Laurence Allan, Jr., 3,790,863.

Rannow, Robert L., to Thermocycle, Inc. Thermodynamic system. 3,789,617, Cl. 62-115.000.

Rao, Ganta V.; and Gerrish, Oliver B., Sr., to Far-Mar-Co., Inc. Extraction process for preparation of vital wheat gluten from whole wheat kernels. 3,790,553, Cl. 260-112.00g.

Rappoport, Seymour; and Rakocy, William J., to Ronson Corporation. Multi-purpose rotisserie-broiler combination. 3,789,748, Cl. 2-24-72.

Rateli, Roger, to Fives Lille-Cail. Centrifuge machine. 3,789,623, Cl. 64-17.000.

Ratkovich, John M. Radio transmitting hunting arrow with finding means. 3,790,948, Cl. 343-113.00r.

Rau, James E.: *See—*
Gudmundsen, Richard A.; and Rau, James E., 3,790,898.

Raun, Arthur P., to Lilly, Eli, and Company. Ruminant feed utilization improvement. 3,790,667, Cl. 424-115.000.

Raun, Arthur P., to Lilly, Eli, and Company. Ruminant feed utilization improvement. 3,790,668, Cl. 424-117.000.

Rausch, Richard E., to Universal Oil Products Company. Tetrametallic hydrocarbon conversion catalyst and uses thereof. 3,790,473, Cl. 208-139.000.

Rawlins, Wendell G. Track signal responsive to variable frequency. 3,790,776, Cl. 246-40.000.

Ray, Elbert L.: *See—*
Brown, Barry M.; and Ray, Elbert L., 3,789,993.

Ray, Jimmy C. Machine for splicing communication cables. 3,789,482, Cl. 29-203.00d.

Ray, Jimmy C. Strip method. 3,790,917, Cl. 339-95.00r.

Raytheon Company: *See—*
Goldstein, Irving; and Rambauske, Werner R., 3,790,257.
Rambauske, Werner R., 3,790,258.

Razgulov, Mikhail Mikhailovich; Astafiev, Georgy Vasilievich; and Korolkov, Ivan Alexandrovich. Surgical instrument for suturing blood vessels with u-shaped staples. 3,790,057, Cl. 227-19.000.

RCA Corporation: *See—*
Campbell, Francis Joseph, 3,790,845.
Champan, Paul Leonard, 3,789,600.
Gorog, Istvan, 3,790,701.
Hannan, William James; and Frattarola, Joseph Ralph, 3,790,245.
Pankove, Jacques Isaac, 3,790,853.
Wheatley, Carl Franklin, Jr., 3,790,897.

Rea, Samuel N.: *See—*
Scraeder, Charles R.; Rea, Samuel N.; Tao, Yung; and Hanna, Elias G., 3,790,859.

Reaville, Eric T.: *See—*
Heimsch, Robert A.; and Reaville, Eric T., 3,790,389.

Redifer, Robert B. Windshield washer system. 3,790,083, Cl. 239-284.000.

Redman, James C.; and Trent, Lynn E., to GTE Sylvania Incorporated. Apparatus and method for counting repetitive patterns in strips of moving apertured material. 3,790,762, Cl. 235-92.00v.

Reed Rolled Thread Die Company: *See—*
Dickson, Joseph F., 3,789,643.

Rees, David B., to United States Steel Corporation. Wrapping apparatus. 3,789,594, Cl. 57-10.000.

Reeves, Wilson A.: *See—*
Daigle, Donald J.; Drake, George L., Jr.; and Reeves, Wilson A., 3,790,639.

Regie Nationale des Usines Renault: *See—*
Tixier, Michel, 3,790,771.

Reich, Charles, to Minnesota Mining and Manufacturing Company. Abrasive-filled dental prophylactic cup. 3,789,462, Cl. 22-59.000.

Reif, William M.; and Lauder, Robert B. Hydroxymethylamino nitrile salts for quenching the fluorescence of optical brightening agents. 3,790,443, Cl. 162-158.000.

Reimschuessel, Annemarle C.: *See—*
Paterson, Arthur R.; and Reimschuessel, Annemarle C., 3,790,417.

Reiner, Lawrence O. Fireplace closure apparatus. 3,789,825, Cl. 126-140.000.

Reinhall, Rolf Bertil. Grinding apparatus. 3,790,092, Cl. 241-38.000.

Reinhard, Clyde. Radiant energy heating system for temperature control of living subjects. 3,789,853, Cl. 128-399.000.

Reinicke, Robert H.: *See—*
Kempton, Calvin E.; and Reinicke, Robert H., 3,789,876.

Reinking, Klaus: *See—*
Rosenbaum, Heinz Jorg; Rudolph, Hans; Dhein, Rolf; and Reinking, Klaus, 3,790,516.

Reip, Raymond G., to Vapor Corporation. Hydraulic valve. 3,790,127, Cl. 251-129.000.

Reis, Wilhelm: *See—*
Mika, Norbert; Grassmann, Peter H.; and Reis, Wilhelm, 3,790,802.

Reisgies, Rolf W.; and Jones, Franklin D., to Sta-Rite Industries, Inc. Automatic milking unit. 3,789,798, Cl. 119-14.080.

Remers, William Alan; Gibs, Gabriel Joseph; and Weiss, Martin Joseph, to American Cyanamid Company. 2-Amino-1,3,4-thiadiazole-5-carboxaldehyde oxime and 2-acetamido-1,3,4-thiadiazole-carbonitrile. 3,790,590, Cl. 260-306.80d.

Remon-Beauvais, Philippe Marie Antoine Jacques: *See—*
Mesnet, Jean Dominique Francois; Remon-Beauvais, Philippe Marie Antoine Jacques; Barbarin, Jean Francois; Le Guennec, Raymond Louis; and Daddon, Georges Edouard Louis Leon, 3,790,111.

Rempes, Paul E., Jr.: *See—*
Westenkirshner, Frank A.; and Rempes, Paul E., Jr., 3,790,842.

Renshaw, John H., to Lockheed Aircraft Corporation. Boundary layer air control mechanism for aircraft. 3,790,107, Cl. 244-42.0cc.

Repco Research Pty., Ltd.: *See—*
Brock, Alan J., 3,790,375.

Repetto, Silvio, to Rizzi, Luigi, & Co., S.p.A. Automatic thickness regulator for skin-shaving machines. 3,789,632, Cl. 69-42.000.

Repina, Eleonora Nikolaevna: *See—*
Makhkamov, Kajum; Kalontarov, Iosif Yakubovich; and Repina, Eleonora Nikolaevna, 3,790,341.

Research Corporation: *See—*
Gunja-Smith, Zeenat, 3,790,446.
Hodosh, Milton, 3,790,507.

Research Products Corporation: *See—*
Delany, John J.; and Liebmann, John M., 3,789,589.

Retzer, Kenneth W.: *See—*
Kampf, Julian C.; and Retzer, Kenneth W., 3,790,862.

Rey, Andre Rene. Bisecting plane rotary motion transmission device. 3,789,625, Cl. 64-21.000.

Rheinmetall G.m.b.H.: *See—*
Gampe, Egon, 3,790,329.
Helmes, Alfred, 3,789,730.

Rhone-Poulenc S.A.: *See—*
Morel, Jacques, 3,790,635.

Ribbans, Robert Clark, III, to Du Pont de Nemours, E. I., and Company. Glass fabric coated with crack-free fluorocarbon resin. 3,790,403, Cl. 117-76.00t.

Rich, Theodore A., to Environment/One Corporation. Amplifying and holding measurement circuit. 3,790,887, Cl. 324-111.000.
Richard, Eugene D.: *See—*
Richard, George E.; and Richard, Eugene D., 3,789,612.
Richard, George E.; and Richard, Eugene D. Method of surf generation. 3,789,612, Cl. 61-1.000.
Richards Manufacturing Company, Inc.: *See—*
Treace, Harry T., 3,790,249.
Richardson Chemical Company, The: *See—*
Weisenberger, Lavern M.; and Biora, Julio L., 3,790,451.
Richins, David A.: *See—*
Beck, Roderick; Harman, James F.; Shatila, Mounir A.; Richins, David A.; and Lack, John, 3,789,750.
Richley, Joseph L., to Bethlehem Steel Corporation. Adjustable quill and quill head mounting therefor. 3,789,596, Cl. 57-55.000.
Richter, Albert P., Jr.; and McEvers, William R., Jr., to Texaco Inc. Borehole deviation measurement while drilling. 3,789,510, Cl. 33-306.000.
Richter, Antonin, to Ustav pro vyzkum Motorovych vozidel. 3,789,808, Cl. 123-71.00r.
Richter Gedeon Vegyeszeti Gyar R.T.: *See—*
Tuba, Zoltan; and Bor, Maria, nee Szabo, 3,790,574.
Richter, Gerhard: *See—*
Mund, Konrad; Richter, Gerhard; and Wenzel, Magdalena, 3,790,410.
Richter, Ulf, to Dynamit Nobel Aktiengesellschaft. Welding arrangement of explosive-plated metal sheets. 3,790,354, Cl. 29-191.000.
Rickard, Timothy W.: *See—*
Lenhart, Ronald A.; and Rickard, Timothy W., 3,790,167.
Ridge Tool Company, The: *See—*
Province, William F., 3,789,493.
Ridpath, Jeffrey David, to Shakespeare Company. Visual braking warning device for land vehicles. 3,790,932, Cl. 340-62.000.
Riedel, Rudolf; Zelder, Felix; and Gilles, Horst, to Seitz-Werke G.m.b.H. Control arrangement for a vessel filling machine. 3,789,889, Cl. 141-140.000.
Riedel, Rudolf; and Zelder, Felix, to Seitz-Werke G.m.b.H. Rotating vessel processing machine, especially vessel filling machine. 3,789,890, Cl. 141-144.000.
Rietz, Adelbert E. Golf swing grooving device. 3,790,176, Cl. 273-186.00r.
Rifkin, Ernest; and Dreibelbis, Richard C., to Carrier Corporation. Thermostat assembly. 3,790,075, Cl. 236-49.000.
Rigel, Yehoshua; and Singer, Eduard. Tie holder. 3,790,045, Cl. 223-87.000.
Rinckhoff, John B.: *See—*
Shah, Indravadan S.; and Rinckhoff, John B., 3,789,902.
Ripley, Charles C., to General Electric Company. Method of manufacturing a nuclear fuel assembly spacer. 3,789,476, Cl. 29-163.50r.
Rishovd, Sigurd, to Royal Industries, Inc. Method and apparatus for inflating tubeless tires and the like. 3,789,901, Cl. 157-1.100.
Ritsema, Irving R., to Bendix Corporation, The. Modulator for adaptive braking system. 3,790,224, Cl. 303-21.00f.
Riv-Skf Officine Di Villar Perosa S.p.A.: *See—*
Camosso, Domenico, 3,789,624.
Rizzi, Luigi, & Co., S.p.A.: *See—*
Repetto, Silvio, 3,789,632.
RNB Associates, Inc.: *See—*
Berglund, Richard N.; and Liu, Benjamin Y. H., 3,790,079.
Robbins, John Lyndon; and Bridge, Samuel Douglas, to Dixon, R. G., & Company, Limited. Rotary guard for surface treating machines. 3,789,554, Cl. 51-274.000.
Robbins, Joseph J.: *See—*
Butts, Mervin R.; and Robbins, Joseph J., 3,790,311.
Roberts, Marvin E.; Cohn, Reuben J.; and Ward, James E., to Locking Systems, Inc. Rotary disc tumbler lock construction. 3,789,638, Cl. 70-366.000.
Robertson, George: *See—*
Robertson, Roderick, 3,789,941.
Robertson, James B.: *See—*
United States of America, National Aeronautics and Space Administration, 3,790,795.
Robertson, Kenneth: *See—*
Robertson, Roderick, 3,789,941.
Robertson, Roderick, to Robertson, George, Robertson, Kenneth, Robinson, Roderick and Dolby, William Berkeley, mesne. Transporters. 3,789,941, Cl. 180-9.220.
Robinson, Graham Ernest, to Imperial Chemical Industries, Limited. Bicycloheptene-7-syn-carbaldehyes. 3,790,632, Cl. 260-557.00b.
Robinson, Leroy E.: *See—*
Shofner, Don L.; Robinson, Leroy E.; and Martinovich, Robert J., 3,789,754.
Robinson, Prentice I.: *See—*
Howard, Robert; and Robinson, Prentice I., 3,789,969.
Robinson, Roderick: *See—*
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Rockwell International Corporation: *See—*
Keshishian, Vahe, 3,790,440.
Vail, Robert W., 3,790,876.
Rodeffer, David W.: *See—*
Iwasyk, John M.; and Rodeffer, David W., 3,789,584.
Rodman Industries, Inc.: *See—*
Yip, James K., 3,789,549.
Rodriguez, Rodolfo, to Miles Laboratories, Inc. 1-(2-pyridyl) piperazine and levodopa composition. 3,790,674, Cl. 424-250.000.
Rogalski, Frank. Water heating and cooling system with humidity control means. 3,789,918, Cl. 165-19.000.
Rogers, Fred A.; and Berend, David, to Wiss, J., & Sons Co. Direct current power supply for electrical appliances. 3,790,810, Cl. 307-66.000.
Rogers, Thelmer A. Complete pipelayer. 3,789,614, Cl. 61-72.600.
Rohm & Haas Company: *See—*
Nemec, Joseph W.; and Schlaefer, Francis W., 3,790,502.
Roland, Charles H., to Phillips Petroleum Company. Compact press and pellet plunger. 3,790,330, Cl. 425-412.000.
Rollei-Werke Franke & Heidecki: *See—*
Subotta, Reinhard, 3,790,269.
Romeo, Vincent P.: *See—*
De Vita, Raymond A.; Romeo, Vincent P.; and Carney, James E., 3,789,483.
Romer, Bendt Wegge; and Pedersen, Hans Kristian, to Danfoss A/S. Spring suspension for mounting the motor compressor of a refrigerating machine in its case. 3,790,308, Cl. 417-363.000.
Romstad, Catherine J. Educational flash cards. 3,789,517, Cl. 35-9.00e.
Ronk, Elmer L.: *See—*
O'Neill, Richard J.; Blaker, Gene M.; Manthei, Edward C.; and Ronk, Elmer L., 3,790,951.
Ronsin, Michel: *See—*
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Ronson Corporation: *See—*
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Rooney, Clarence S.: *See—*
Carlson, John A.; Hoff, Dale R.; and Rooney, Clarence S., 3,790,592.
Carlson, John A.; Hoff, Dale R.; and Rooney, Clarence S., 3,790,593.
Rooney, James L., to Niagara Plastics, Inc. Coat hanger with collapsible hook. 3,790,046, Cl. 223-92.000.
Rose, Edgar, to Outboard Marine Corporation. Snowmobile track. 3,790,231, Cl. 305-35.0eb.
Rose, Edward: *See—*
Talbot, Richard C.; Rose, Edward; and Roth, Robert A., 3,789,964.
Roseberry, Donald E.: *See—*
Kendall, George A.; and Roseberry, Donald E., 3,789,709.
Rosenbaum, Heinz Jorg; and Rudolph, Hans, to Bayer Aktiengesellschaft. Pourable, storable polymerizable lactam-catalyst-activator mixtures. 3,790,515, Cl. 260-18.00n.
Rosenbaum, Heinz Jorg; Rudolph, Hans; Dhein, Rolf; and Reinking, Klaus, to Bayer Aktiengesellschaft. Pourable, storable, polymerizable lactam-catalyst-activator composition. 3,790,516, Cl. 260-18.00n.
Rosenblatt, Richard D. Device for assisting cigarette smokers to discontinue smoking. 3,789,840, Cl. 128-260.000.
Rosenblatt, Richard D. Body ornament with electroluminescent portion. 3,790,775, Cl. 240-2.250.
Rosenblatt, William: *See—*
Bluestein, Claire; Rosenblatt, William; and Clark, John R., 3,790,602.
Rosenwald, Gary W., to Cities Service Oil Company. Cell for collecting and mixing fluids. 3,789,670, Cl. 73-421.00r.
Ross, Edward A.: *See—*
Banyas, John D.; and Ross, Edward A., 3,790,087.
Rossell, John Barry: *See—*
Caverly, Brian Leonard; Meertens, Gerard Joseph Hendrik; and Rossell, John Barry, 3,790,608.
Rossi, Albert; Jacobson, Norman; and Miller, Harold N., to Esso Research and Engineering Company. Residual fuels improved in its flow characteristics by a copolymer of C_{22} to C_{40} linear alpha-olefin and styrene or a C_3 to C_8 alpha-olefin. 3,790,358, Cl. 44-62.000.
Rossigno, Louis P., to Bendix Corporation, The. Tow vehicle trailer braking system. 3,790,807, Cl. 303-7.000.
Rossio, John H., to La Ros Equipment Company, Inc. Parts separator. 3,789,981, Cl. 209-78.000.
Rotaque (Proprietary) Limited: *See—*
Joubert, Robert Montaque, 3,790,008.
Roth, Gregory L. Thermoelectromagnetic energy conversion system. 3,790,829, Cl. 310-4.000.
Roth, Robert A.: *See—*
Talbot, Richard C.; Rose, Edward; and Roth, Robert A., 3,789,964.
Round-Eight Corporation: *See—*
Wood, Robert F., 3,789,560.
Roussel-UCLAF: *See—*
Perronnet, Jacques; and Demoute, Jean-Pierre, 3,790,570.
Pierdet, Andre; and Azadian, Genevieve, 3,790,564.
Routson, Willis G., to Dow Chemical Company, The. Composition and method for diminishing the flow of water into permeable strata. 3,789,613, Cl. 61-1.00r.
Rouxel, Roland; and Chevalier, Gabriel, to Societe Generale de Constructions Electriques et Mecaniques. Time delay compensation in a closed loop process control system. 3,790,764, Cl. 235-150.100.
Rowan, Daniel P.: *See—*
Newman, Peter M.; and Rowan, Daniel P., 3,790,772.
Rowe, Donald R.: *See—*
Lloyd, William G.; and Rowe, Donald R., 3,790,662.
Rowell, Byron G., to I.R.A., Incorporated. Dead EED protective sleeve for use in processing taconite. 3,789,878, Cl. 137-590.000.
Royal Industries, Inc.: *See—*

Rishovd, Sigurd, 3,789,901.
Rubel, Edward A.: *See—*
Cowan, Larry C.; and Rubel, Edward A., 3,789,864.
Rubel, Peter Adrian: *See—*
Rule, Clinton; and Rubel, Peter Adrian, 3,789,537.
Rubin, Robert M. Gulf shoe. 3,789,523, Cl. 36-2.5 1h.
Rubio, Manuel Jesus; and Leal, Victor Mario, to Barrera, Roberto Gonzalez. Process, machine and chart for tensile testing. 3,789,660, Cl. 73-169.000.
Rudelick, John, to Multi-Pro, Inc. Unsinkable raft. 3,789,446, Cl. 9-11.00r.
Rudolph, Hans: *See—*
Rosenbaum, Heinz Jorg; and Rudolph, Hans, 3,790,515.
Rosenbaum, Heinz Jorg; Rudolph, Hans; Dhein, Rolf; and Reinking, Klaus, 3,790,516.
Rudston, Stanley George; Hyford, Derek Clark; and Blanchard, Peter Michael, to British Petroleum Company Limited, The. Synthetic lubricant for aero gas turbines. 3,790,478, Cl. 252-34.000.
Rufer, Clemens: *See—*
Gibiani, Heinz; Kiesluch, Klaus; Koch, Hans-Joachim; Kosmol, Horst; Rufer, Clemens; Schroder, Eberhard; and Walsh, Rosemarie, nee Vossing, 3,790,445.
Ruget, Gabriel, to Compagnie des Ateliers et Forges de la Loire: Saint Chamond; Firminy; Saint Etienne; Jacob Holtzer; C.A.E.L. Manufacture of hollow cylindrical bodies. 3,789,908, Cl. 164-52.000.
Rule, Clinton; and Rubel, Peter Adrian, to Rule Industries, Inc. Multiple rod electrodes. 3,789,537, Cl. 43-112.000.
Rule Industries, Inc.: *See—*
Rule, Clinton; and Rubel, Peter Adrian, 3,789,537.
Rupp, Hans-Dieter: *See—*
Magerlein, Helmut; Meyer, Gerhard; and Rupp, Hans-Dieter, 3,790,627.
Rusk, Gerald R.; and Koch, Robert E., to Freeman Supply Company, The. Matching pattern plates. 3,789,912, Cl. 164-243.000.
Ruske, Ervin. Level tie-down. 3,789,652, Cl. 72-457.000.
Russell, Walter, 1/3 to Tolash, Carol Ann, 1/3 to Tolash, Victoria L. and 1/3 to Tolash, Julianna. Random access card filing and retrieval apparatus. 3,789,982, Cl. 209-80.500.
Rutherford, Sherman L., to Varian Associates. Apparatus for printing of charge images. 3,789,753, Cl. 101-1.000.
Ruti Machinery Works, Ltd.; formerly Caspar Honegger, Ruti Zurich: *See—*
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Ryan, Charles W.: *See—*
Gerzon, Koert; Ryan, Charles W.; and De Long, Donald C., 3,790,673.
Ryan, Kelly P., to Blair Manufacturing Co., Inc. Manure spreader with bed closing gate. 3,790,035, Cl. 222-178.000.
Rybicki, Edward B.; Sussman, Milton H.; and Tackaberry, Robert B., to American Optical Corporation. Microscope condenser series. 3,790,254, Cl. 350-183.000.
Rykalin, Nikolai Nikolaevich: *See—*
Lipshits, Viktor Senderovich; Andrianov, Vladimir Rubenovich; Rykalin, Nikolai Nikolaevich; Krasnev, Tibor Ferentsevich; Podola, Nikolai Vasilievich; and Krivonos, Vadim Petrovich, 3,790,739.
Ryo, Toshihiko: *See—*
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S & C Electric Company: *See—*
Sakats, Gerald, 3,790,861.
S.A. Ciments LaFarge: *See—*
Magnan, Regts, 3,790,394.
Saadeh, Fuad T., to Texaco Inc. Angular accelerometer. 3,789,935, Cl. 175-40.000.
Safeway Products, Inc.: *See—*
Miller, Robert C., 3,790,753.
Sagl, Rudolph J. C., to B.E.L. - Tronics Limited. Power take-off switch. 3,790,808, Cl. 307-10.00r.
Saito, Akio, to Shinwa Kagaku Kogyo Kabushiki Kaisha. Packing containers. 3,789,897, Cl. 150-11.000.
Saito, Tadao: *See—*
Inose, Hiroshi; Masuko, Yutaka; and Saito, Tadao, 3,790,715.
Saito, Yasoji, to Nichi-Ber Blind Kogyo Kabushiki Kaisha. Vertical type venetian blind. 3,789,905, Cl. 160-168.000.
Saito, Yoshiomi; Sasaki, Hiroshi; Yamaguchi, Mamoru; Fukuda, Hide; Yamada, Humio; and Kimura, Koji, to Japanese Geon Company, Ltd., The. Process for preparing vulcanized epihalohydrin polymers. 3,790,524, Cl. 260-45.80n.
Sakai, Hiroshi; Igarashi, Kazuo; Yamamoto, Takuji; and Matsuo, Normichi. Method of treating non-conducting and poorly conducting film. 3,790,406, Cl. 117-227.000.
Sakai, Michihiko; Sato, Yasuo; Mortmoro, Rokuya; Konishi, Kazuo; and Maki, Katsuyuki, to Takeda Chemical Industries, Ltd. Dialkylphenyl-N-methyl-N-haloacetyl carbamates. 3,790,621, Cl. 260-479.00c.
Sakai, Toshihiko: *See—*
Komatsu, Noboru; Nozaki, Choji; Kurauchi, Toshio; and Sakai, Toshihiko, 3,790,208.
Sakats, Gerald, to S & C Electric Company. Switchgear with fuses individually mounted on fuse carriers and switches therefor for interlocks. 3,790,861, Cl. 317-114.000.
Saldenais, Arvids: *See—*
Smoot, Charles W.; and Saldenais, Arvids, 3,790,274.
Saleck, Wilhelm: *See—*
Posse, Rolf-Fred; Saleck, Wilhelm; Muller, Herbert; Randolph, August; and Moll, Franz, 3,790,386.
Salminen, Teuvo: *See—*
Aalionen, Lasse; Salminen, Teuvo; and Vaisanen, Voitto, 3,789,924.
Saltzman, Alvin R.; and Plizak, Bruno T., to United States of America, Navy. Thermal catalytic chemical reaction of non-newtonian fluids. 3,790,486, Cl. 252-77.000.
Salvis AG: *See—*
Bolleter, Hans Ulrich; and Schulthess, Hansruedi, 3,790,391.
Samlyody, Arpod: *See—*
Doane, John C.; Holz, George E.; Ogle, James A.; and Samlyody, Arpod, 3,790,850.
Samour, Carlos M. Pressure sensitive adhesive copolymers and tapes therefrom. 3,790,533, Cl. 260-78.50r.
Sanders, Vernard W.; and Fane, William J., to Norris Industries, Inc. Dead bolt latch. 3,790,196, Cl. 292-140.000.
Sandner, Winfried: *See—*
Knechiel, Wilhelm; Petersdorf, Gerhard; and Sandner, Winfried, 3,790,272.
Sandoz Wander, Inc.: *See—*
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Sankyo Company, Limited: *See—*
Murayama, Keisuke; Toda, Toshimasa; Mori, Eiko; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Watanabe, Ichiro, 3,790,525.
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Sano, Kazuya: *See—*
Oishi, Yashushi; Yoshida, Yoshinobu; and Sano, Kazuya, 3,790,384.
Oishi, Yasushi; Sano, Kazuya; and Yoshida, Yoshinobu, 3,790,379.
Shiba, Keisuke; Sano, Kazuya; Okumura, Akio; and Kubodera, Seiiti, 3,790,388.
Sapper, Richard. Lamp with an articulated support. 3,790,773, Cl. 240-81.0bd.
Sarafidis, Christos: *See—*
Campbell, John B.; Cluff, Edward Fuller; and Sarafidis, Christos, 3,790,480.
Sarett, Lewis H.; Shen, Tsung-Ying; and Dorn, Conrad P., Jr., to Merck & Co., Inc. Preventing pain, fever and inflammation with cyclic hydroxy sulfoxides. 3,790,676, Cl. 424-275.000.
Sasaki, Hiroshi: *See—*
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Sato, Akira: *See—*
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Sato, Hiroshi: *See—*
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Sato, Hiroshi; Okumura, Munehiro; and Arita, Masujiro, to Mitsubishi Rayon Company, Ltd. Method for producing water containing microcapsules. 3,790,497, Cl. 252-316.000.
Sato, Kiyoshi: *See—*
Oga, Shunichiro; Sato, Kiyoshi; Imada, Katsumi; and Asano, Kazuo, 3,790,444.
Sato, Masamichi; and Tamai, Yasuo, to Xerox Corporation. Process for producing electrophotographic liquid developer. 3,790,485, Cl. 252-62.100.
Sato, Yasuo: *See—*
Sakai, Michihiko; Sato, Yasuo; Mortmoro, Rokuya; Konishi, Kazuo; and Maki, Katsuyuki, 3,790,621.
Satomura, Masato: *See—*
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Sattler, Walter J., to General Motors Corporation. Internal combustion engine speed limiting circuit. 3,789,810, Cl. 123-102.000.
Sauer, Hans, to Matsushita Electric Works, Ltd. Relay-plug-in contact spring. 3,790,924, Cl. 339-258.00r.
Sauer, Reinhold: *See—*
Laux, Raymond Wilhelm; and Sauer, Reinhold, 3,790,239.
Saur, Walter: *See—*
Bahr, Siegmund; and Saur, Walter, 3,790,040.
Sautereau, Claude. Planetary type drawing table. 3,789,777, Cl. 108-4.000.
Savin Business Machines Corporation: *See—*
Smith, Ian Edward; Hastwell, Peter John; and Vermeulen, Marinus Cornelius, 3,789,794.
Sawano, Yukio: *See—*
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Sayers, Eugene H.: *See—*
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Scannell, John B., to Parker-Hannifin Corporation. Packing. 3,790,179, Cl. 277-124.000.
Scappatura, Rocco: *See—*
Laserson, Gregory L.; Feinman, Harvey; Stand, Mille; Glatzer, Stephen G.; and Scappatura, Rocco, 3,790,727.
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Schantz, Raymond G.: *See—*
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Schantz, Socrates J.: *See—*
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Scharfen, Hans, to Forkardt, Paul, Kommanditgesellschaft. Swivel chuck for machining workpieces with a plurality of axes crossing each other. 3,790,181, Cl. 279-4.000.
Schartmann, Knut Roger, to Northern Electric Company, Limited. Digital decoder for multiple frequency telephone signalling. 3,790,720, Cl. 179-84.0vf.
Scheibe, Hans: *See—*
United States of America, National Aeronautics and Space Administration, 3,790,037.
Scheier, Stanley C. Container. 3,790,067, Cl. 229-55.000.
Schenkel, Gerrit, to U.S. Philips Corporation. Electromagnetic microphone including at least one acoustic resistance. 3,790,724, Cl. 179-180.000.
Scheper, George W., Jr.: *See—*
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Gibiani, Heinz; Kiesluch, Klaus; Koch, Hans-Joachim; Kosmol, Horst; Rufer, Clemens; Schroder, Eberhard; and Walsh, Rosemarie, nee Vossing, 3,790,445.
Schiano, Antoinette; and Schiano, Rosemary. Dispensing container for rolled sheet material. 3,790,053, Cl. 225-48.000.
Schiano, Rosemary: *See—*
Schiano, Antoinette; and Schiano, Rosemary, 3,790,053.
Schieber, Hans; and Krause, Erich, to Universal Maschinenfabrik Dr. Rudolf Schieber G.m.b.H. Lock or cam arrangement for knitting machines. 3,789,630, Cl. 66-78.000.
Schild, A., S.A.: *See—*
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Schipper, Pieter W. Permutation lock. 3,789,637, Cl. 70-299.000.
Schlaefer, Francis W.: *See—*
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Schlichting, Heidi: *See—*
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Schmid, Alfred, to Baier, Webasto-Werk W., KG. Control device for the sliding roofs of vehicles. 3,789,645, Cl. 74-491.000.
Schmidt, Andreas; Brunetti, Heimo; and Schwarzenbach, Kurt, to Ciba-Geigy Corporation. Process for the manufacture of benzylphosphonates. 3,790,648, Cl. 260-970.000.
Schmidt, Felix Helmut: *See—*
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Schmidt, Gunter, to Production, Inc. Daylight film handling system. 3,790,160, Cl. 271-18.00r.
Schmidt, Robert P.; and Menke, Richard S. Apparatus for a thumb wrestling game. 3,790,165, Cl. 273-1.00r.
Schmidt, Ulrich, to Bosch, Robert, G.m.b.H. Gas turbidity measuring apparatus. 3,790,289, Cl. 356-205.000.
Schmidt, Warren J.: *See—*
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Schmidt, Willi J.; Kornelli, Wolfgang; and Werner, Eberhard, to Kalle Aktiengesellschaft. Method and apparatus for equalizing longitudinal variations in the running of a web under tension. 3,790,056, Cl. 226-195.000.
Schmitt, Emil S. Valve. 3,790,132, Cl. 251-312.000.
Schnell, Gerhard, to Bosch, Robert, G.m.b.H. Conveying arrangement. 3,790,001, Cl. 214-1.0bd.
Schnitzer, David H.; and Absler, Howard K., to Uarco Incorporated. Combination record and envelope assembly with severable receipt. 3,790,070, Cl. 229-92.800.
Schoen, Oscar W., Jr., to United States of America, Navy. Transducer pressure release system. 3,790,928, Cl. 340-8.00r.
Schoeps, Knut Christian; and Karden, Karl Gosta, to Atlas Capco Aktiebolag. Rotary impact motor. 3,789,934, Cl. 173-93.500.
Scholze, Peter: *See—*
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Schon, Nikolaus, to Bayer Aktiengesellschaft. Process for the production of thermoreversible coacervates. 3,790,538, Cl. 260-29.60h.
Schon, Nikolaus; Pampus, Gottfried; and Witte, Josef, to Bayer Aktiengesellschaft. Process for the preparation of trans-polypentenamer. 3,790,546, Cl. 260-93.100.
Schon, Rudolf, to SKF Kugellagerfabriken GmbH. Apparatus for the spindleless spinning of textile fibers. 3,789,597, Cl. 57-58.890.
Schonbeck, Rupert: *See—*
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Schraft, Horst; and Mack, Horst, to Werner & Pfeiderer, Firma. Continuous tunnel oven for baking and/or drying. 3,789,516, Cl. 34-216.000.
Schreiner, Louis W., 50% to Carter, Charles M. Temperature responsive control device. 3,789,815, Cl. 123-119.00f.
Schroder, Eberhard: *See—*
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Schroder, Hohann, to U.S. Philips Corporation. Method of producing calorific energy. 3,790,357, Cl. 44-3.00r.
Schubert, Emil Georg. Rotary internal combustion engine. 3,789,809, Cl. 123-8.050.
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Schuffenhauer, Erhard: *See—*
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Schulte, Rudolf R., to Heyer-Schulte Corporation. Urethral prosthesis. 3,789,828, Cl. 128-1.00r.
Schulthess, Hansruedi: *See—*
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Schultz, Arthur P. Switching system. 3,789,765, Cl. 104-96.000.
Schultz, Neithart; Vahlensieck, Hans-Joachim; and Martens, Peter, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of 1,1,1-trifluoro-2-chloro-2-bromoethane. 3,790,462, Cl. 204-163.00r.
Schumacher, Ignatius; and Baker, Joseph W. Preparation of esters of phosphorus acids. 3,790,649, Cl. 260-973.000.
Schuman, Ralph Henry, to Warner & Swasey Company, The. Toolholder. 3,790,182, Cl. 279-43.000.
Schuttloffel, Erich, to Licentia Patent Verwaltungs-G.m.b.H. Waveguide for simultaneously transmitting two electromagnetic waves. 3,790,905, Cl. 333-95.00a.
Schwaller, Bernard L. Compressor valve assembly. 3,790,151, Cl. 267-151.000.
Schwartz, David M.: *See—*
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Schwartz, Newton: *See—*
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Scraeder, Charles R.; Rea, Samuel N.; Tao, Yung; and Hanna, Elias G., to Texas Instruments, Incorporated. Electronic package header system having omni-directional heat dissipation characteristic. 3,790,859, Cl. 317-100.000.
Sealectro Corporation: *See—*
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Sekikawa, Nobuyoshi: *See—*
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Sellet, Lucien, to Diamond Shamrock Corporation. Alkoxylated mannich compositions and derivatives thereof. 3,790,606, Cl. 260-401.000.
Sels, Wally O.; and Paul, Alfred L., to Brock-White Co. Column form and clamp assembly. 3,790,121, Cl. 249-219.00r.

Semenov, Roman Lvovich: *See—*
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Senesky, Albert P., to Owens-Illinois, Inc. Metal cap sorter. 3,789,983, Cl. 209-111.600.
Senning, Alexander; Buchholt, Hans Christian; Bierling, Robert; Steinhoff, Dieter; and Trossmann, Gerhard, to Bayer Aktiengesellschaft. Sulphonic acid esters, their production and compositions of and uses therefor. 3,790,616, Cl. 260-456.00a.
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Shadoan, Carl W., 20% to Lee, Raymond, Organization, Inc., The. Tool for installing disc brakes. 3,789,477, Cl. 29-200.00p.
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Shiba, Keisuke; Sano, Kazuya; Okumura, Akio; and Kubodera, Seiiti, to Fuji Photo Film Company, Ltd. Direct positive color photographic materials. 3,790,388, Cl. 96-100.000.
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Shimizu, Kunio; Tamaki, Isao; and Yamashita, Noriyuki, to Sony Corporation. Automatic gain control circuit. 3,790,896, Cl. 330-29.000.
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Skil Corporation: *See*—
Jarecki, John S., 3,789,933.

Skillern, John A. Concentric target assembly having side storage compartments. 3,790,174, Cl. 273-105.00a.

Skinner, Jerald Paul. Interlocking structural units. 3,789,556, Cl. 52-93.000.

Skold, Mats Folke. Method for joining crosswisely extending reinforcing bars. 3,789,474, Cl. 29-155.00r.

Skold, Mats Folke. Apparatus for joining and supporting crosswisely extending reinforcing bars. 3,789,491, Cl. 29-212.00r.

Skolnick, Michael L.: *See*—
Buczek, Carl J.; Skolnick, Michael L.; and Gurski, Gary F., 3,790,278.

Skutecki, Edmund R.: *See*—
Campbell, Curtis M.; McConnell, Walter J.; and Skutecki, Edmund R., 3,790,947.

Slamecka, Ernst; Kapitany, Hans; and Zemann, Egon, to Siemens Aktiengesellschaft. Electrical contact apparatus. 3,790,732, Cl. 200-166.0bb.

Sloat, Robert J.: *See*—
Dada, Abdul G.; Dehollander, William R.; and Sloat, Robert J., 3,790,493.

Small Business Administration, mesne: *See*—
Alexander, Delbert S., Jr., 3,790,170.

Smets, George Joseph; and Vandensavel, Jean Marie, to Agfa-Gevaert N.V. Process for insolubilizing polymers with masked isocynates. 3,790,377, Cl. 96-35.100.

Smidth, F. L., & Co.: *See*—
Andreassen, Victor Paul, 3,790,335.

Smith, David K., to United States of America, Army. Pulse width selector. 3,790,881, Cl. 328-112.000.

Smith, David P. Motorized swimming aid. 3,789,792, Cl. 115-6.100.

Smith, George Frederick. Fork-lift wheeled vehicle. 3,790,013, Cl. 214-674.000.

Smith, Harry E., to Hartman Metal Fabricators, Inc. Null track for automatic stacker. 3,790,005, Cl. 214-16.40a.

Smith, Hugh M.: *See*—
Hafele, Frederick J.; and Smith, Hugh M., 3,790,575.

Smith, Ian Edward; Hastwell, Peter John; and Vermeulen, Marinus Cornelius, to Savin Business Machines Corporation. Apparatus for developing electrostatic images. 3,789,794, Cl. 118-7.000.

Smith, James B. Well fluid separation method and apparatus. 3,789,583, Cl. 55-171.000.

Smith, John Cambridge, to Hydro-Mite Limited. Rotary couplings. 3,789,627, Cl. 64-31.000.

Smith, Oscar H., to General Motors Corporation. Dip casting method using transpirationally cooled mold having relieved impervious outer layer. 3,789,909, Cl. 164-87.000.

Smith, Russell M., to General Electric Company. Individual axle wheel slip control system. 3,790,871, Cl. 318-52.000.

Smith, Thomas D.; and Weston, Jasper B., Jr., to Scientific-Atlanta, Inc. Antenna array for minimizing co-channel interference. 3,790,950, Cl. 343-792.500.

Smith, William Stephens, to Dresser Industries, Inc. Nut collecting and retaining socket for power tools. 3,789,706, Cl. 81-57.290.

Smithe, F. L., Machine Company, Inc.: *See*—
Helm, Herbert W., 3,790,163.

Smithkline Corporation: *See*—
Blackburn, Dale W.; Devenney, Robert F.; and Jen, Timothy Yu-Wen, 3,790,573.

Smolin, Edwin M.: *See*—
Kiss, Kornel D.; Mills, George S.; and Smolin, Edwin M., 3,790,647.

Smoot, Charles W.; and Saldenais, Arvids, to Apeco Corporation. Carriage adjusting mechanism for camera. 3,790,274, Cl. 355-55.000.

Snelling, Charles D.; Andrews, Theodore E.; and Weller, John J., to Armstrong Cork Company, mesne. Rotary casting machine. 3,790,320, Cl. 425-4.00r.

Snelson, Jimmy W.: *See*—
Hudson, Jimmie E.; and Snelson, Jimmy W., 3,790,319.

Snodgrass, Robert H.; Carter, James R.; and Edstrom, Carl M., to Aluminum Company of America. Method of producing composite metal article. 3,789,497, Cl. 29-453.000.

Snorkel Tire Equipment Company: *See*—
Morris, Carrol V., 3,789,869.

Snow, Harold F. Method and apparatus for eviscerating clams. 3,789,457, Cl. 17-48.000.

Soceite Anonyme pour Tous Apparcielages Mecaniques S.A.: *See*—
Huvey, Michel; and Le Meur, Germain, 3,790,418.

Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France: *See*—
Bulteau, Gerard C., 3,790,681.

Societe Francaise d'Equipements pour la Nanigation Aerienne: *See*—
Willoteaux, Guy C., 3,790,763.

Societe Generale de Constructions Electriques et Mecaniques: *See*—
Rouxel, Roland; and Chevalier, Gabriel, 3,790,764.

Societe Genevoise d'Instruments de Physique: *See*—
Mottu, Andre; and Heimann, Arnold, 3,790,296.

Societe Grenobloise d'Etudes et d'Applications Hydrauliques (SOGREAH): *See*—
Valiboose, Bernard; and Pichon, Jacques, 3,789,988.

Societe Internationale de Mecanique Industrielle S.A.: *See*—
Mincuzzi, Antonio, 3,790,889.

Societe pour l'Application des Hautes Temperatures (Quartex): *See*—
Prquignot, Michel, 3,789,499.

Societe pour le Developpement de la Recherche Applique: *See*—
Combes, Robert P., 3,789,866.

Societe Suisse pour l'Industrie Horlogere SA: *See*—
Dome, Peter, 3,789,599.

Sokolov, Leonid Pavlovich: *See*—
Afanasiev, Alexandr Dmitrievich; Lykov, Alexei Gavrilovich; Mogilevsky, Alexandr Moiseevich; Sokolov, Leonid Pavlovich; and Fridman, Evl Gershkovich, 3,789,974.

Solomon, Peter R., to United Aircraft Corporation. Variable coupling DC superconducting transformer. 3,790,880, Cl. 323-44.00f.

Soltesz, Carl R.: *See*—
Brunton, Donald C.; and Soltesz, Carl R., 3,790,796.

Solvay & Cie: *See*—
Giacopelli, Umberto, 3,790,465.
Obsomer, Marc, 3,790,644.

Sommer, Reinhold, 50% to Muller, Hans. Ski safety binding. 3,790,185, Cl. 280-11.35t.

Sone, Maso; Okazaki, Mitsutoshi; and Ueyama, Yasuomi, to Japan Exlan Company, Limited. Synthetic fibers for artificial hair and production thereof. 3,790,434, Cl. 161-181.000.

Song, W. R.; and Jacobson, Norman, to Esso Research and Engineering Company. Lubricating oils containing a vinyl aromatic C_9 to C_{18} olefin and C_{12} to C_{20} olefin terpolymer. 3,790,483, Cl. 252-59.000.

Sony Corporation: *See*—
Kubota, Yasuharu; and Shiono, Ryuji, 3,790,702.
Nemoto, Tsuneo, 3,789,452.
Ohsawa, Mitsuo, 3,790,714.
Shimizu, Kunio; Tamaki, Isao; and Yamashita, Noriyuki, 3,790,896.

Soshea Richard W., to Hewlett-Packard Company. Efficient red emitting electroluminescent semiconductor. 3,790,868, Cl. 317-235.00r.

Spang, Kjett Knut I.: *See*—
Egerbork, Bo Malte S.; Gadefelt, Goran R.; Hagbjer, Gunnar Ingemar; and Spang, Kjett Knut I., 3,790,078.

Spartanics, Ltd.: *See*—
Mohan, William L.; and Willits, Samuel P., 3,790,759.

Spear Systems, Inc.: *See*—
Speer, Billy L., 3,789,782.

Speer, Billy L., to Spear Systems, Inc. Sewing machine cutter. 3,789,782, Cl. 112-130.000.

Spencer, Herbert E.; and Mitchell, Tommy S. Trailer home jack and method of operating the same. 3,789,558, Cl. 52-143.000.

Spengler, Duane E.; and Bartoo, Charles O., to Quaker Oats Company, The. Elevator for toy parking garage. 3,789,538, Cl. 46-12.000.

Sperry Rand Corporation: *See*—
Best, Albert M.; and Alverson, Robert M., 3,789,593.
Campbell, Curtis M.; McConnell, Walter J.; and Skutecki, Edmund R., 3,790,947.
Strenglein, Harry F., 3,789,950.

Spicer, John J. Mobile leaf pulverizer. 3,790,094, Cl. 241-101.100.

Spiegelberg, Hans: *See*—
Edenhofer, Albrecht; and Spiegelberg, Hans, 3,790,583.

Spindt, Charles A.; Shoulders, Kenneth R.; and Heynick, Louis N., to Stanford Research Institute. Field emission cathode structures, devices utilizing such structures, and methods of producing such structures. 3,789,471, Cl. 29-25.170.

Spitz, William R.: *See*—
Taplin, Lael B.; Spitz, William R.; and Leung, Chun Keung, 3,789,816.

Spoerle, F. Steven; and Palmer, Elmer W., to Nalco Chemical Company. Latices for industrial waste coagulation. 3,790,476, Cl. 210-47.000.

Sprague, Brinton. Abrasive recovery system. 3,790,007, Cl. 214-17.00d.

Square D Company: *See*—
Kampf, Julian C.; and Retzer, Kenneth W., 3,790,862.

Squire, William D.: *See*—
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 3,790,930.

Sta-Rite Industries, Inc.: *See*—

Reisgies, Rolf W.; and Jones, Franklin D., 3,789,798.

Stackhouse, Wells F., to American Locker Company, Inc. Mail box unit. 3,790,244, Cl. 312-215.000.

Stahl Metal Products Division: *See—*
Seiwert, Robert C., 3,789,550.

Stahlfeld, Donald L.: *See—*
Carr, Norman L.; and Stahlfeld, Donald L., 3,789,581.

Stand, Mille: *See—*
Laserson, Gregory L.; Feinman, Harvey; Stand, Mille; Glatzer, Stephen G.; and Scappatura, Rocco, 3,790,727.

Stanford Research Institute: *See—*
Spindt, Charles A.; Shoulders, Kenneth R.; and Heynick, Louis N., 3,789,471.

Stange Co.: *See—*
Criss, William H.; and Shackeleford, John R., 3,790,685.

Star-Kist Foods, Inc.: *See—*
Brewer, Andrew I., 3,789,797.

Stastny, Edwin O.: *See—*
Sims, Anson; Stastny, Edwin O.; and Deny, Janos, 3,789,542.

Stauffer Chemical Company: *See—*
Fancher, Llewellyn W., 3,790,363.
Gutman, Arnold D., 3,790,670.
Lee, Hwalin, 3,790,680.
Leon, Albert M.; and Whittington, Robert C., 3,790,628.
Mettinger, Sylvester Martin, 3,790,651.
Teach, Eugene G., 3,790,364.
Uhing, Eugene Henry; and Toy, Arthur Dock Fon, 3,790,629.

Stegeman, Berend, to Eddy Match Company, Limited. Vending machine having lever actuated converter panel. 3,790,024, Cl. 221-77.000.

Stein, Jay A.; and Polucci, Gerald, to American Science & Engineering Inc. Radiant energy imaging with rocking scanning. 3,790,799, Cl. 250-363.000.

Steinhoff, Dieter: *See—*
Senning, Alexander; Buchholt, Hans Christian; Bierling, Robert; Steinhoff, Dieter; and Trossmann, Gerhard, 3,790,616.

Stellmacher, Wilhelm, to Mannesmann Aktiengesellschaft. Steam flow control in continuous casting machines with direct spray water cooling. 3,789,913, Cl. 164-283.000.

Stenger, Donald R., to Hill-Rockford Co. Needle bearing assembling machine. 3,789,478, Cl. 29-201.000.

Stephenson, Robert A.; and Zoch, Robert M., Jr., to Enercon Corporation International. Injector apparatus. 3,790,139, Cl. 261-18.00a.

Steppan, Hartmut; Uhlig, Fritz; and Giesse, Roland, to Kalle Aktiengesellschaft. Light-sensitive diazo copying composition and copying material produced therewith. 3,790,385, Cl. 96-75.000.

Sterling Drug Inc.: *See—*
Diana, Guy D., 3,790,631.

Stern, Eric P. Illuminated book support. 3,790,770, Cl. 240-2.00p.

Sternberg, Stanley R.; Young, James E.; and Lennington, John W. Method and system for the infrared analysis of gases. 3,790,797, Cl. 250-345.000.

Sternberg, Stanley R.; Young, James E.; and Lennington, John W., to Metro Hydraulics, Inc. Method and system for the infrared analysis of gases. 3,790,798, Cl. 250-345.000.

Steudler, Frederick W., Jr., to Vallorbs Jewel Company, The. Water fountain system. 3,789,800, Cl. 119-18.000.

Stewart, Allstair Templeton: *See—*
Love, Ronald Barr; and Stewart, Allstair Templeton, 3,790,342.

Stewart, Edward F., to International Telephone and Telegraph Corporation. Test arrangement for a two-wire telephone channel. 3,790,723, Cl. 179-175.300.

Stiller, Paul F., to Cornell Aeronautical Laboratory, Inc. Apparatus for counting, differentiating and sorting particles according to their microstructure variations. 3,790,760, Cl. 235-92.0pc.

Stirling, James Alexander; and Carlton, Gordon. Mechanical handling of goods. 3,790,010, Cl. 214-152.000.

Stolzer, Paul, to Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Co., K.G. Bandsaw machine. 3,789,717, Cl. 83-796.000.

Stone, William C., to United States of America, Army, mesne. Tandem solid-hybrid rocket motor. 3,789,610, Cl. 60-245.000.

Stoneberger, James L.; and Sylvester, Charles B., to Utec Constructors, Inc. Preparing cable for splicing. 3,790,737, Cl. 219-76.000.

Stop-Motion Devices Corporation: *See—*
Deniega, Jose Castillo, 3,789,631.

Stoplifter International, Inc., mesne: *See—*
Fearon, Edward R., 3,790,945.

Storp, Klaus; and Hohne, Reinhard, to Metallgesellschaft Aktiengesellschaft. Activated carbon catalyst impregnated with SiO_2. 3,790,659, Cl. 423-224.000.

Straccamore, Armand E. Unique prewrapped box structure and unique method of making same. 3,790,069, Cl. 229-87.00r.

Straley, James M.: *See—*
Weaver, Max A.; and Straley, James M., 3,790,557.

Streckert, Thomas. Veneer handling apparatus. 3,789,979, Cl. 209-73.000.

Strenglein, Harry F., to Sperry Rand Corporation. Vehicle protective apparatus. 3,789,950, Cl. 180-98.000.

Stresau, Richard; and Bonde, Robert, to United States of America, Navy. Explosive lead plug. 3,789,764, Cl. 102-70.00r.

Stripling, William W., to United States of America, Army. Polarized air bearing assembly. 3,789,677, Cl. 74-5.700.

Strobel, Felix; and Allenspach, Heinz, to Mettler Instrumente AG. Electrical balance including monitoring means. 3,789,937, Cl. 177-210.000.

Stroh, Alvin L., to McMillin Wire and Plating, Inc. Shelf fixture including an attachment device therefor. 3,789,996, Cl. 211-119.000.

Strohmer, Alfred; and Raj, Joachim, to Knorr-Bremse GmbH. Car stablizing control system. 3,789,769, Cl. 105-164.000.

Strom, Richard A.: *See—*
Mayer, William N.; Strom, Richard A.; and Ulstad, Meredith S., 3,790,849.

Strukov, Nikolai Alexeevich: *See—*
Sirota, Nikolai Nikolaevich; Mazurenko, Anatoly Mitrofanovich; and Strukov, Nikolai Alexeevich, 3,790,322.

Stumpf, Walter, to Simmons Company. Method for manufacturing box springs. 3,789,495, Cl. 29-429.000.

Stutz, William, to United States Envelope Company. Continuous form envelope assembly. 3,790,068, Cl. 229-69.000.

Subotta, Reinhard, to Rollei-Werke Franke & Heidecki. Slide projector for ring magazines. 3,790,269, Cl. 353-117.000.

Sucro, Jost S.: *See—*
Benasutti, Louis D.; and Sucro, Jost S., 3,789,620.

Sugiya, Yuji, to Casio Computer Co., Ltd. Deflection electrode assembly for an ink jet type printing device and a method for manufacturing the same. 3,790,953, Cl. 346-75.000.

Sullivan, John L., to Mead Corporation, The. Adjustable binder handle. 3,790,050, Cl. 224-45.00p.

Sullivan, John L., to Mead Corporation, The. Binder carrier and support structure. 3,790,242, Cl. 312-184.000.

Sulzer Brothers Limited: *See—*
Aguet, Emilt, 3,789,804.

Sulzer Brothers Ltd.: *See—*
Feiss, Rene T., 3,790,060.
Laubli, Fritz, 3,789,588.

Sumitomo Chemical Company, Limited: *See—*
Yagi, Yoshiharu; Kobayashi, Akira; and Sato, Hiroshi, 3,790,551.

Summers, James E.; and Elwood, Michael J., to Xerox Corporation. Automatic document handler. 3,790,158, Cl. 271-4.000.

Sun Chemical Corporation: *See—*
Hafele, Frederick J.; and Smith, Hugh M., 3,790,575.

Sun Oil Company of Pennsylvania, mesne: *See—*
Hommer, Gordon H., 3,790,479.

Sunbeam Lighting Co.: *See—*
Miller, Jack V.; and Galindo, Rudolph D., 3,790,774.

Surowiex, Roman: *See—*
Boaz, Premakaran T.; and Surowiex, Roman, 3,790,752.

Surrey Steel Components, Limited: *See—*
Conn, Jack Samuel; and Fabien, Lionel Ralph, 3,789,861.

Susin, Victor G., to Young Rubber Co. Extension runner system sprue arrangements for molding apparatus. 3,790,324, Cl. 425-247.000.

Sussman, Milton H.: *See—*
Rybicki, Edward B.; Sussman, Milton H.; and Tackaberry, Robert B., 3,790,254.

Sutton, Robert W.: *See—*
Bondie, Dale J.; Sutton, Robert W.; and Lewelling, James L., 3,789,500.

Suvorov, Nikolai Nikolaevich; Avramenko, Vladimir Grigorievich; Shkilkova, Valentina Nikolaevna; and Zamyshlyaeva, Lidia Ionovna. Method of producing indoll and substitution products of the same. 3,790,596, Cl. 260-319.100.

Suyetani, Shigemitsu. Foot support for wheelchairs. 3,790,212, Cl. 297-429.000.

Swagert, Dean R.: *See—*
Motter, John C.; Motter, John C., Jr.; and Swagert, Dean R., 3,789,757.

Swain, James C.; and Adams, Cecil B., to Abex Corporation. Vane pump having extended undervane suction ports. 3,790,314, Cl. 418-1.000.

Swatty, Eugene E., to Fluid Controls, Inc. Control valve with power accumulating, snap action, spool drive. 3,790,125, Cl. 251-75.000.

Swedish Hospital Supply SHS AB: *See—*
Malmstrom, Sven-Erik, 3,789,830.

Sweeney, Thomas E.; Schweizer, William S.; and Morris, James J. Flap system. 3,790,106, Cl. 244-42.0cb.

Swinson, Weldon F., to White, Harmon, & Associates, Inc. Scattered light polariscope. 3,790,285, Cl. 356-115.000.

Sylvester, Charles B.: *See—*
Stoneberger, James L.; and Sylvester, Charles B., 3,790,737.

Synthelabo: *See—*
Wermuth, Camille Georges; and Cahn, Jean, 3,790,563.

Tabuchi, Hideho: *See—*
Inoue, Minoru; Ishimatsu, Kenji; and Tabuchi, Hideho, 3,790,782.

Tackaberry, Robert B.: *See—*
Rybicki, Edward B.; Sussman, Milton H.; and Tackaberry, Robert B., 3,790,254.

Taguchi, Toshio: *See—*
Ikeda, Shinichi; and Taguchi, Toshio, 3,789,857.

Takahashi, Isao; and Kimura, Tsutomu. Circuit for controlling exposure. 3,790,789, Cl. 250-209.000.

Takai, Hideo: *See—*
Nakano, Hiroshi; Takai, Hideo; and Nakajima, Fumio, 3,789,461.

Takasaki, Shigeaki, to Haneshige Tenter Clip Co., Ltd. Tenter clip. 3,789,468, Cl. 26-62.000.

Takazawa, Ietsogu. Double curtain device. 3,789,904, Cl. 160-120.000.

Takeda Chemical Industries, Ltd.: *See—*
Sakai, Michihiko; Sato, Yasuo; Mortmoro, Rokuya; Konishi, Kazuo; and Maki, Katsuyuki, 3,790,621.

Takeda, Naozi, to Matsushita Electric Industrial Co., Ltd. Disc armature. 3,790,835, Cl. 310-258.000.

Talbot, Richard C.; Rose, Edward; and Roth, Robert A., to Peters Machinery Company. Apparatus for supplying slugs of cookies in preselected side-by-side groups for bagging. 3,789,964, Cl. 192-29.000.

Taliaferro, William D.: *See—*
Henley, Ronald W.; and Taliaferro, William D., 3,789,926.

Tall, Leonard H.; Carlstedt, Paul A.; and Erickson, Arlen J., to CX Processing Laboratories, Inc. Processor S photographic print sorting and packaging machine and method. 3,789,571, Cl. 53-54.000.

Talmage, Charles Robert: *See—*
Brede, Aiexander, III; Talmage, Charles Robert; and Tuttle, Elvin E., 3,790,336.

Tam, George M.; Gardner, Delbert J.; Grabe, Frederick G.; Putt, James B.; Owens, Carl D.; and Sisco, William C., to Bendix Corporation, The. Diverter valve means for pressure differentially operated servomotor. 3,789,735, Cl. 91-1.000.

Tam, Leslie K.: *See—*
Montague, Bernard R.; Leyburn, Derek; Barker, John; Hannley, Ray John; Leblanc, Vincent G.; and Tam, Leslie K., 3,790,719.

Tamai, Yasuo: *See—*
Sato, Masamichi; and Tamai, Yasuo, 3,790,485.

Tamaki, Isao: *See—*
Shimizu, Kunio; Tamaki, Isao; and Yamashita, Noriyuki, 3,790,896.

Tamborski, Robert S., to Pullman Incorporated. Cushioned underframe for railway cars. 3,789,999, Cl. 213-8.000.

Tamura, Nobuhiro: *See—*
Kominami, Naoya; Tamura, Nobuhiro; Mikami, Hiroshi; and Yamamoto, Etsuo, 3,790,642.

Tan, Yoichi; and Ryo, Toshihiko, to Nippon Electric Company, Limited. Clock pulse regenerating circuit for demodulating input pulse signal having uneven time pulse distribution. 3,790,892, Cl. 328-120.000.

Tanaka, Katsutoshi: *See—*
Fujimura, Kinji; and Tanaka, Katsutoshi, 3,790,529.

Tanaka, Susumu, to Minolta Camera Kabushiki Kaisha. Electrophotographic duplicator of the transfer type. 3,790,273, Cl. 355-16.000.

Tanaka, Tetsuro. Lower speed synchronous motor. 3,790,834, Cl. 310-162.000.

Tanba, Shigeru; Yoshiyasu, Mitsuo; and Miyabe, Yoshio, to Mitsubishi Petrochemical Company, Limited. Synthetic papers and method of making. 3,790,435, Cl. 161-160.000.

Tanigawa, Shizuhiko; Ishikawa, Shinzaburo; and Ono, Natsumi, to Matsushita Electric Industrial Co., Ltd. Card reader. 3,790,758, Cl. 235-61.11r.

Tanimura, Shigeru; Miura, Nobuaki; Asano, Usamu; and Yamamura, Nobuyuki, to Omron Tatesis Electronics Co. Humidity sensitive semiconductor device. 3,790,869, Cl. 317-235.00t.

Tanner, Hal W., Jr.: *See—*
Prappier, Robert H.; Tanner, Hal W., Jr.; and Wagers William O., 3,790,399.

Tao, Yung: *See—*
Scraeder, Charles R.; Rea, Samuel N.; Tao, Yung; and Hanna, Elias G., 3,790,859.

Taplin, Lael B.; Spitz, William R.; and Leung, Chun Keung, to Bendix Corporation, The. Lean limit internal combustion engine roughness control system. 3,789,816, Cl. 123-119.00r.

Taprogge, Ludwig: *See—*
Treplin, Friedrich-Wilhelm; Veltmann, Guido; and Thal, Heinz, 3,789,992.

Tatina, Richard A.: *See—*
Broling, Keith W.; and Tatina, Richard A., 3,789,775.

Tausheck, Russell W., to ACE Glass Co. Tiltable glass cutting table. 3,790,003, Cl. 214-1.00s.

Tawara, Yoshio; and Senno, Harufumi, to Matsushita Electric Industrial Co., Ltd. As-cast, rare-earth-Co-Cu permanent magnet material. 3,790,414, Cl. 148-31.570.

Taxin, Harry M.: *See—*
Callais, Richard T.; Eisenberg, Herbert; Forbes, F. Douglas; Kosco, Thomas J.; Taxin, Harry M.; and Frost, John B., 3,790,700.

Taylor, P. Craig: *See—*
Mitchell, Dean L.; Bishop, Stephen G.; and Taylor, P. Craig, 3,790,250.

Teach, Eugene G., to Stauffer Chemical Company. Meta-anilide urea compositions and their utility as herbicides. 3,790,364, Cl. 71-120.000.

Tearne, David; and Weissmul'er, Adam, to Mosler Safe Company, The. Pneumatic tube transmit and receive terminal. 3,790,102, Cl. 243-19.000.

Teitel, Sidney: *See—*
Brossi, Arnold; Focella, Antonino; and Teitel, Sidney, 3,790,636.

Teldix GmbH: *See—*
Wehde, Heinz, 3,790,225.

Telectrotype Corporation of America: *See—*
Bugg, Vernon M., Sr.; and Bugg, Francis V., 3,790,708.

Tenneco Oil Company: *See—*
Lent, Robert R.; and Firth, Francis G., 3,789,791.

Tesaki, Kiyoshi; and Hiraoka, Michio, to Nippon Soda Co., Ltd. Process for preparation of oxybenzoyl polymer. 3,790,528, Cl. 260-47.00c.

Tesch, Gunter Horst: *See—*
Colijn, Johannes Jacobus Vincent; and Tesch, Gunter Horst, 3,790,652.

Tetra Pak Internation AB: *See—*
Martensson, Kjell Halvard; Linda, Bjorn Hison; Palsson, Jan Frederik; and Jerrf, Sven Torsten, 3,789,746.

Texaco Inc.: *See—*
Mead, Theodore C.; Cummins, Billy H.; and Coleman, Richard L., 3,790,470.
Richter, Albert P., Jr.; and McEvers, William R., Jr., 3,789,510.
Saadeh, Fuad T., 3,789,935.

Texas Instruments, Incorporated: *See—*
Jones, James J., 3,790,820.
Scraeder, Charles R.; Rea, Samuel N.; Tao, Yung; and Hanna, Elias G., 3,790,859.

Textron, Inc.: *See—*
Earl, T. Desmond, 3,790,110.
Moertel, George B., 3,789,465.
Pascher, Robert L., 3,790,302.

Thal, Heinz: *See—*
Treplin, Friedrich-Wilhelm; Veltmann, Guido; and Thal, Heinz, 3,789,992.

Theriault, Robert John; Karwowski, James Paul; and Wideburg, Norman Earl, to Abbott Laboratories. Derivatives of 2,3-dihydroxypropyl-N-(7 or 8-chloro-4-quinolinyl) anthranilate. 3,790,578, Cl. 260-287.00r.

Thermocycle, Inc.: *See—*
Rannow, Robert L., 3,789,617.

Thier, Herbert D.: *See—*
Montgomery, Marshall A.; Thier, Herbert D.; and Oreli, John D., 3,789,519.

Thiokol Chemical Corporation: *See—*
Horvath, William, 3,790,034.

Thom, Robert A. Picture framing mat and edge molding. 3,789,529, Cl. 40-158.00r.

Thomas & Betts Corporation: *See—*
Farkas, Paul, 3,790,018.

Thomas, Georges: *See—*
Petit, Maurice; and Thomas, Georges, 3,789,785.

Thompson, Dorman N.: *See—*
Pearson, Walter C.; Quinn, Edward P.; and Thompson, Dorman N., 3,790,041.

Thompson, Lee E.; and Ramsey, William W., to Ramsey Winch Co. Keyway cutting and milling machine. 3,789,733, Cl. 90-14.000.

Thomson-CSF: *See—*
Becavin, Henri; and Ronsin, Michel, 3,790,942.
Bert, Alain; Enjalbert, Roger; and Kern, Pierre, 3,790,843.
Gaucheron, Jean Marie, 3,790,710.

Thorn, Herbert, to Ideal Toy Corporation. Doll having collapsible torso and means for closing doll's eyes upon tilting. 3,789,544, Cl. 46-41.000.

Thornberg, Dean S.: *See—*
Pickles, Sidney; and Thornberg, Dean S., 3,790,943.

Thornton, James C.; and Whyte, Donald E., to Johnson, S. C., & Son, Inc. Vapor dispensing device. 3,790,081, Cl. 239-55.000.

Threlkeld, Richard James. Long play film cartridge and projector. 3,790,261, Cl. 352-72.000.

Tillson, Henry C., to Hercules Incorporated. Epihalohydrin rubber vulcanization. 3,790,506, Cl. 260-2.00a.

Time Computer, Inc., mesne: *See—*
Bergey, John M., 3,789,601.

Timken Company, The: *See—*
Cameron, Robert W., 3,790,178.
Otto, Dennis L., 3,790,238.

Timmermans, Abraham. Method of making a gas- and/or vapour discharge tube ready for operation. 3,790,837, Cl. 313-46.000.

Tixier, Michel, to Regie Nationale des Usines Renault and Automobiles Peugeot. Dip correctors for headlamps of vehicles. 3,790,771, Cl. 240-7.11j.

Tobin, Curtis L.: *See—*
Italiano, Frank; Tobin, Curtis L.; Martin, William C., Jr.; and Honnold, Fred V., Jr., 3,790,114.

Tobinick, Sidney, to Aqua Therm Products Corporation. Light-weight minimum volume water pad with integral water container securement means. 3,789,442, Cl. 5-348.0wb.

Tobita, Kuniharu: *See—*
Ida, Saburo; and Tobita, Kuniharu, 3,789,975.

Toda, Toshimasa: *See—*
Murayama, Keisuke; Toda, Toshimasa; Mori, Eiko; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Watanabe, Ichiro, 3,790,525.

Toivanen, Toivo A.: *See—*
Bryk, Petri B.; Honkasalo, Jorma B.; Malmstron, Rolf E.; Makipirtti, Simo A. I.; Toivanen, Toivo A.; and Aaltonen, Olavi A., 3,790,366.

Tokizawa, Makoto: *See—*
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Tokuyama Soda Kabushiki Kaisha: *See—*
Motani, Kensuke; Kiyotoshi, Tadahiro; and Nakahara, Akihiko, 3,790,535.

Tolash, Carol Ann: *See—*
Russell, Walter, 3,789,982.

Tolash, Julianna: *See—*
Russell, Walter, 3,789,982.

Tolash, Victoria L.: *See—*

Russell, Walter, 3,789,982.
Tole, Ingvar L.; Herzing, Vernon J.; Miller, Everett L.; and Lightfoot, George L., to General Foods Corporation. Apparatus for automatically stacking material. 3,790,004, Cl. 214-614.000.
Tolk, Norman Henry: *See—*
Simms, Douglas Leon; Tolk, Norman Henry; and White, Clark Woody, 3,790,411.
Toll, Louis Robert. Cutting tool. 3,790,052, Cl. 225-2.000.
Tomio, Ernst A., to Du Pont de Nemours, E. I., and Company. Chemical foaming and sensitizing of water-bearing explosives with hydrogen peroxide. 3,790,415, Cl. 149-2.000.
Tonka Corporation: *See—*
Good, Thomas W.; and Zbikowski, Theodore H., 3,789,541.
Topham, Lyle C.: *See—*
Amdahl, Gene M.; Clements, Michael R.; and Topham, Lyle C., 3,790,960.
Toti, Andrew J. Structural unit. 3,789,563, Cl. 52-731.000.
Tovar, Theodor, to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Plurality of electrically connected semiconductors forming a high voltage rectifier. 3,790,865, Cl. 317-234.00r.
Toy, Arthur Dock Fon: *See—*
Uhing, Eugene Henry; and Toy, Arthur Dock Fon, 3,790,629.
Toyoda Koki Kabushiki Kaisha: *See—*
Kurimoto, Mikishi; Munekata, Keniti; and Kamiya, Yoji, 3,789,501.
Toyoda, Minoru, to Murata Manufacturing Co., Ltd. Secondary electron multiplying device using semiconductor ceramic. 3,790,840, Cl. 313-105.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Nagoya, Itaru Niimi; Hashimoto, Kametaro; Ushitani, Kenzi; Serino, Yoichi; Mitani, Seishu; and Imanishi, Kunizo, 3,790,352.
Niimi, Itaru; Hashimoto, Kametaro; Ushitani, Kenzi; Serino, Yoichi; Ishihara, Ko; Mitani, Seishu; and Imanishi, Kunizo, 3,790,351.
Traber, Walter; Hambock, Heinz; and Weiss, Anton George, to Ciba-Geigy Corporation. O,N-diphenylthiocarbamic acid esters. 3,790,615, Cl. 260-455.00a.
Travor, Bruce W., to United States of America, Army. Propagation transfer arrangement. 3,789,761, Cl. 102-27.00r.
Treace, Harry T., to Richards Manufacturing Company, Inc. Illuminating means for operating microscope. 3,790,249, Cl. 350-91.000.
Trementozzi, Quirino A., to Monsanto Company. Packages with improved properties. 3,790,684, Cl. 99-171.0lp.
Tremewan, R. S.: *See—*
Carson, Loren A.; Tremewan, R. S.; and Yanke, Ronald C., 3,789,893.
Trent, Lynn E.: *See—*
Redman, James C.; and Trent, Lynn E., 3,790,762.
Treplin, Friedrich-Wilhelm; Veltmann, Guido; and Thal, Heinz, to Taprogge, Ludwig. Screen installation for separating solids from liquid streams in pipelines. 3,789,992, Cl. 210-405.000.
Tridan Tool & Machine, Inc.: *See—*
Ames, Ward A., 3,789,648.
Trieschmann, Hans-Georg; Pfanmueller, Helmut; and Zeitler, Gerhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Chlorinating polyethylene. 3,790,548, Cl. 260-94.90h.
Trieste, Mario R. Elastomeric seal positioning support construction. 3,790,294, Cl. 404-68.000.
Triller, Adolf J.: *See—*
Muller, Joachim M.; and Triller, Adolf J., 3,790,290.
Tringali, Donald: *See—*
Van Brunt, John; and Tringali, Donald, 3,789,635.
Triolo, Rocco P., to Scott Paper Company. Light-stable polyurethane foam formed by reaction of a polyol and a mixture of aromatic and aliphatic polyisocyanates. 3,790,508, Cl. 260-2.5at.
Trossmann, Gerhard: *See—*
Senning, Alexander; Buchholt, Hans Christian; Bierling, Robert; Steinhoff, Dieter; and Trossmann, Gerhard, 3,790,616.
TRW Inc.: *See—*
Berman, Baruch, 3,790,816.
Herbenar, Edward J., 3,790,195.
Patel, Jayant K., 3,790,832.
Shoup, Thomas E., 3,790,740.
Trygon Electronics Inc.: *See—*
Verdisco, Anthony, 3,790,860.
Tschirky, Hansjorg, to Hoffmann-La Roche Inc. Apparatus for temporarily closing cylindrical containers. 3,789,572, Cl. 53-381.00a.
Tsui, Frank; and Tsui, Katherine, to International Business Machines Corporation. Gas discharge display field for multicolor display. 3,790,841, Cl. 313-108.00b.
Tsui, Katherine: *See—*
Tsui, Frank; and Tsui, Katherine, 3,790,841.
Tuba, Zoltan; and Bor, Maria, nee Szabo, to Richter Gedeon Vegyeszeti Gyar R.T. 21-Substituted 17-aza-steroids and salts thereof. 3,790,574, Cl. 260-268.0pc.
Tung, Chi Fang, to Minnesota Mining and Manufacturing Company. Light-transmissive retroreflective sheeting. 3,790,431, Cl. 161-3.500.
Tupper, Willis E., to Dexter Automatic Products Co., Inc. Vent apparatus. 3,789,871, Cl. 137-493.200.
Turk, Joseph: *See—*
Vollrath, Walter J., Jr.; Vollrath, Richard J.; Virnoche, Paul R.; Turk, Joseph; Gerdes, Paul E.; and Singer, Roy W., 3,789,434.
Turkdogan, Ethem T.: *See—*
Olsson, Robert G.; and Turkdogan, Ethem T., 3,790,368.
Olsson, Robert G.; and Turkdogan, Ethem T., 3,790,369.
Turolla, Marco. Gear pump. 3,790,316, Cl. 418-131.000.
Tuttle, Elvin E.: *See—*
Brede, Alexander, III; Talmage, Charles Robert; and Tuttle, Elvin E., 3,790,336.
Twin Bay Industries, Inc.: *See—*
Converse, Gordon L.; and Mihulka, Merle C., 3,789,892.
Twinn-K, Inc., mesne: *See—*
Broz, Jerry J., 3,789,768.
Tyagi, Ramesh C.: *See—*
United States of America, National Aeronautics and Space Administration, 3,790,795.
Uarco Incorporated: *See—*
Schnitzer, David H.; and Absler, Howard K., 3,790,070.
Udding, Anne C., to Shell Oil Company. Catalyst for the preparation of polyether-type polymers. 3,790,499, Cl. 252-431.00r.
Ueda, Hiroyuki; and Sawano, Yukio, to Fuji Shashin Film Kabushiki Kaisha. Microfiche projecting apparatus. 3,790,266, Cl. 353-27.000.
Uefuji, Zenichiro, to Fujiwara Manufacturing Company, Ltd. Pumping trap for condensate. 3,790,306, Cl. 417-128.000
Ueyama, Yasuomi: *See—*
Sone, Maso; Okazaki, Mitsutoshi; and Ueyama, Yasuomi, 3,790,434.
Uhing, Eugene Henry; and Toy, Arthur Dock Fon, to Stauffer Chemical Company. Process for preparing alkyl or aryl thiophosphorus halides and mixed isomers thereof. 3,790,629, Cl. 260-543.00p.
Uhlig, Fritz: *See—*
Steppan, Hartmut; Uhlig, Fritz; and Giesse, Roland, 3,790,385.
Uhrentechniker, Alfred Eisele, to Pforzkeimer Uhren-Rohwerke Inh. Calendar timepiece with multiple language displays. 3,789,603, Cl. 58-58.000.
Ulstad, Meredith S.: *See—*
Mayer, William N.; Strom, Richard A.; and Ulstad, Meredith S., 3,790,849.
Umetsu, Masakazu: *See—*
Kato, Taketosi; Umetsu, Masakazu; and Kobayashi, Toshio, 3,790,360.
Underwood, William George Elphinstone: *See—*
Kennedy, James; Long, Alan Gibson; and Underwood, William George Elphinstone, 3,790,567.
Uni-Cardan AG: *See—*
Girguis, Subhy Labib, 3,789,626.
Union Carbide Corporation: *See—*
Bliss, Joseph Francis, 3,790,522.
Fox, Joseph S.; and Koetting, Jerome D., 3,790,658.
Miller, Adam R., 3,790,550.
Miller, Adam Roy, 3,790,036.
Uniroyal Englebert France S.A.: *See—*
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Uniroyal, Inc.: *See—*
Ariyan, Zaven S.; and Ma, Shih-Yu, 3,790,600.
Atwell, William J.; and Cranston, Lawrence, 3,790,419.
United Aircraft Corporation: *See—*
Buczek, Carl J.; Skolnick, Michael L.; and Gurski, Gary F., 3,790,278.
Solomon, Peter R., 3,790,880.
United Kingdom Atomic Energy Authority: *See—*
Brunskill, Robert Thompson; and Langmead, Walter Alfred, 3,790,783.
United Kingdom of Great Britain and Northern Ireland, Secretary of State for State for Defense in Her Britannic Majesty's Government of the: *See—*
Chivers, Malcolm; Dawson, William Grant; Masterman, Paul Henry; and Weston, Martin Andrew, 3,790,941.
Paddison, Denys Ian, 3,790,779.
United States Envelope Company: *See—*
Stutz, William, 3,790,068.
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Agriculture: *See—*
Arthur, Jett C., Jr.; and Bains, Malkiat S., 3,790,562.
Daigle, Donald J.; Drake, George L., Jr.; and Reeves, Wilson A., 3,790,639.
Eddy, Gaines W.; Davis, Harry G.; Beroza, Morton; and McGovern, Terrence P., 3,790,666.
Walter, William M., Jr.; and Purcell, Albert L., 3,790,688.
Army: *See—*
Ching, Larry K. W., Jr.; and Shafter, Carl E., 3,789,657.
Nimylowycz, Osyp; and Lorenz, George, 3,790,113.
Smith, David K., 3,790,881.
Stripling, William W., 3,789,677.
Travor, Bruce W., 3,789,761.
Wilson, Ben F., 3,790,088.
Army, mesne: *See—*
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Atomic Energy Commission: *See—*
Fulwyler, Mack J., 3,790,492.
Health, Education, and Welfare: *See—*
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Johnson, Alan J.; and Newman, Jack, 3,790,552.
National Aeronautics and Space Administration: *See—*
Blumrich, Josef F., 3,789,947.
Heier, Wilbur C., 3,790,650.
Jones, Robert A., 3,789,654.

National Aeronautics and Space Administration; Administrator; with respect to an invention of:
Bogner, Richard S.; and Farris, Charles D. Storage battery comprising negative plates of a wedge-shaped configuration. 3,790,409, Cl. 136-20.000.
Clements, Philip A. System for stabilizing cable phase delay utilizing a coaxial cable under pressure. 3,790,906, Cl. 333-16.000.
Cook, Thomas A.; and Scheibe, Hans. Metering gas dispensing precisely measures charges of fluid. 3,790,037, Cl. 222-324.000.
Kalkbrenner, Ralph W. Heat transfer device. 3,789,920, Cl. 165-105.000.
Kimball, Robert B.; Hodder, David T.; and Wrinkle, Walter W. Apparatus for remote handling of materials. 3,790,347, Cl. 23-253.00c.
Tyagi, Ramesh C.; Robertson, James B.; Boer, Karl W.; and Hadley, Henry C., Jr. High field CDS detector for infrared radiation. 3,790,795, Cl. 250-338.000.
Van Auken, Richard. Reinforced polyquinoxaline gasket and method of preparing the same. 3,790,432, Cl. 161-93.000.

Navy: *See—*
Alexander, Edward M., 3,790,907.
Anderson, Matthew E.; and Means, James E., 3,789,674.
Chao, Gene, 3,790,828.
Chwastyk, Adolph M., 3,790,927.
Cook, George W.; and Milne, David T., 3,790,276.
Fielding, George H., 3,790,282.
Frazier, Larry Vane W., 3,789,445.
Jones, Daniel A., 3,790,104.
Krupa, John E., 3,790,824.
Mitchell, Dean L.; Bishop, Stephen G.; and Taylor, P. Craig, 3,790,250.
Murray, Kenneth M.; and Attix, Frank H., 3,790,794.
Peoples, John R., 3,790,103.
Petrick, John T., 3,789,762.
Saltzman, Alvin R.; and Plizak, Bruno T., 3,790,486.
Schoen, Oscar W., Jr., 3,790,928.
Stresau, Richard; and Bonde, Robert, 3,789,764.

Navy, mesne: *See—*
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United States Steel Corporation: *See—*
Didycz, William J.; and Glassman, Donald, 3,790,448.
Edmonson, Fay R., 3,789,882.
Hamilton, Jack L.; Jenks, John W.; and Milberger, John F., 3,789,647.
Miller, William G.; and Polinski, Raymond E., 3,789,641.
Olsson, Robert G.; and Turkdogan, Ethem T., 3,790,368.
Olsson, Robert G.; and Turkdogan, Ethem T., 3,790,369.
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Unitek Corporation: *See—*
Laub, Joseph L.; and Griffiths, Derek Jenkins, 3,790,738.

Universal Maschinenfabrik Dr. Rudolf Schieber G.m.b.H.: *See—*
Schieber, Hans; and Krause, Erich, 3,789,630.

Universal Oil Products Company: *See—*
Bloch, Herman S.; and Bouvar, James J., 3,790,450.
Carson, Don B., 3,789,989.
Gattuso, Marion J.; and Arnold, Robert J., 3,790,534.
Haensel, Vladimir, 3,790,350.
Hausler, Rudolf H., 3,790,496.
Massie, Stephen N.; and Block, Herman S., 3,790,624.
McCartney, Daniel E.; and Mitsche, Roy T., 3,790,503.
Rausch, Richard E., 3,790,473.

Universite de Sherbrooke: *See—*
Lalancette, Jean-Marc, 3,790,370.

University of Pennsylvania: *See—*
Farhat, Nabil H.; and Kopeika, Norman S., 3,790,895.

University of Pennsylvania, Trustees, The: *See—*
Kron, Reuben E., 3,790,016.

Upjohn Company, The: *See—*
Bannister, Brian, 3,790,560.

Upo Osakeyhtio: *See—*
Aalionen, Lasse; Salminen, Teuvo; and Vaisanen, Voitto, 3,789,924.

Urbas, Ernest J., to Guarantee Specialty Manufacturing Company. Parts handling means. 3,790,203, Cl. 294-31.00r.

U.S. Philips Corporation: *See—*
Doittau, Francois-Xavier; Ythier, Jean-Pierre; and Hebert, Marcel, 3,790,890.
Hintz, Harald, 3,790,847.
Schenkel, Gerrit, 3,790,724.
Schroder, Hohann, 3,790,357.

Ushitani, Kenzi: *See—*
Nagoya, Itaru Niimi; Hashimoto, Kametaro; Ushitani, Kenzi; Serino, Yoichi; Mitani, Seishu; and Imanishi, Kunizo, 3,790,352.
Niimi, Itaru; Hashimoto, Kametaro; Ushitani, Kenzi; Serino, Yoichi; Ishihara, Ko; Mitani, Seishu; and Imanishi, Kunizo, 3,790,351.

USM Corporation: *See—*
Cotreau, Alex P.; and Jacobs, John F., 3,789,700.
De Vita, Raymond A.; Romeo, Vincent P.; and Carney, James E., 3,789,483.
Karlyn, David A., 3,790,371.

Ustav pro vyzkum Motorovych vozidel: *See—*
Richter, Antonin, 3,789,808.

Utec Constructors, Inc.: *See—*
Stoneberger, James L.; and Sylvester, Charles B., 3,790,737.

Vahlensieck, Hans-Joachim: *See—*
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 3,790,459.
Schultz, Neithart; Vahlensieck, Hans-Joachim; and Martens, Peter, 3,790,462.

Vail, Robert W., to Rockwell International Corporation. Paper cutting machine. 3,790,876, Cl. 318-603.000.

Vaisanen, Voitto: *See—*
Aalionen, Lasse; Salminen, Teuvo; and Vaisanen, Voitto, 3,789,924.

Valenie, Raymond L., to Manco Manufacturing Co. Apparatus for fabricating structural members. 3,789,489, Cl. 29-208.00c.

Valenta, Harry L., Jr., to Eastman Kodak Company. Method and apparatus for deriving a velocity signal from continuously moving information bearing media. 3,790,707, Cl. 178-7.200.

Valiboose, Bernard; and Pichon, Jacques, to Societe Grenobloise d'Etudes et d'Applications Hydrauliques (SOGREAH). Apparatus for removing surface pollutants from water and other liquids. 3,789,988, Cl. 210-242.000.

Vallorbs Jewel Company, The: *See—*
Steudler, Frederick W., Jr., 3,789,800.

Van Auken, Richard: *See—*
United States of America, National Aeronautics and Space Administration, 3,790,432.

Van Brunt, John; and Tringali, Donald. Stud lock. 3,789,635, Cl. 70-232.000.

Van Buren Industries, Inc.: *See—*
Giles, William H., 3,789,576.

Van Derwater, Glen A., Jr., to Photographic Sciences Corporation. Camera control system. 3,790,262, Cl. 352-84.000.

Van Laethem, Robert; Baudin, Pol; and Hoyois, Jean-Claude, to Glaverbel S.A. Mirror having electrical heating means. 3,790,748, Cl. 219-219.000.

Vancini, Carlo A.: *See—*
Arnold, Orlan M.; and Vancini, Carlo A., 3,789,585.
Arnold, Orlan M.; and Vancini, Carlo A., 3,789,586.

Vandensavel, Jean Marie: *See—*
Smets, George Joseph; and Vandensavel, Jean Marie, 3,790,377.

Vanevenhoven, Peter W., to Lilly, Eli, and Company. Cephalosporin Ca improved process. 3,790,565, Cl. 260-243.00c.

Vann Brothers Limited: *See—*
Johns, Richard Bell, 3,789,506.

Vapor Corporation: *See—*
Reip, Raymond G., 3,790,127.

Varian Associates: *See—*
Rutherford, Sherman L., 3,789,753.

Veisman, Boris Ottovich: *See—*
Brusakov, Jury Ivanovich; Sirotkin, Nikolai Nikolaevich; Kiselev, Vasily Pavlovich; Ilinkov, Dmitry Vladimirovich; Pavlovichavdely, Mikhail; Marin, Semen Panteleevich; Shkarupa, Alexandr Ivanovich; Veisman, Boris Ottovich; Lebedev, Vladimir Nikolaevich; an Gavrilenko, Nikolai Pavlovich, 3,790,692.

Veltmann, Guido: *See—*
Treplin, Friedrich-Wilhelm; Veltmann, Guido; and Thal, Heinz, 3,789,992.

Verdier, Henri, to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie. Pneumatic tires. 3,789,900, Cl. 152-356.000.

Verdile, Rocco. Garment hangers. 3,790,044, Cl. 223-86.000.

Verdisco, Anthony, to Trygon Electronics Inc. Power supply chassis assembly for electronic circuit with coding. 3,790,860, Cl. 317-100.000.

Vereinigte Flugtechnische Werke-Fokker Gesellschaft mit beschrankter Haftung: *See—*
Seidenfaden, Heinz, 3,790,153.

Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft: *See—*
Bachner, Ernst, 3,789,911.
Pelzel, Erich, 3,790,373.

Vermeulen, Marinus Cornelius: *See—*
Smith, Ian Edward; Hastwell, Peter John; and Vermeulen, Marinus Cornelius, 3,789,794.

Vice, Gunter; and Kohfeldt, Werner, to Lignacord GmbH. Folding wall or door. 3,789,906, Cl. 160-199.000.

Victor Equipment Company: *See—*
Douglas, Lloyd A.; and Garanelo, Kirk T., 3,789,820.

Victorius, Claus, to Du Pont de Nemours, E. I., and Company. Thermosetting acrylic polymer powder coating compositions. 3,790,513, Cl. 260-15.000.

Vidaurri, Fernando C., Jr., to Phillips Petroleum Company. Arylene sulfide polymer process. 3,790,536, Cl. 260-79.100.

Vilter Manufacturing Corporation: *See—*
Kocher, Erich J., 3,789,675.

Virnoche, Paul R.: *See—*
Vollrath, Walter J., Jr.; Vollrath, Richard J.; Virnoche, Paul R.; Turk, Joseph; Gerdes, Paul E.; and Singer, Roy W., 3,789,434.

Voeke, Elmer E.: *See—*
Baltz, Albert L.; and Voeke, Elmer E., 3,789,826.

Vogelsang, Francis H., to Maatschappij Van Berkels Patent N.V. Device for maintaining a constant center distance between the output shaft of a resiliently mounted motor and a driven mechanism. 3,789,686, Cl. 74-242.13a.

Vogt, Herwart C.; and Davis, Pauls, to BASF Wyandotte Corporation. Poly(glycidic acid) and methods of preparation therefor. 3,790,625, Cl. 260-535.00p.

Volkswagenwerk Aktiengesellschaft: *See—*
Dao, Wolfram; Langer, Paul; and Gritzan, Hans, 3,789,967.

Vollrath, Richard J.: *See—*
Vollrath, Walter J., Jr.; Vollrath, Richard J.; Virnoche, Paul R.; Turk, Joseph; Gerdes, Paul E.; and Singer, Roy W., 3,789,434.

Vollrath, Walter J., Jr.; Vollrath, Richard J.; Virnoche, Paul R.; Turk, Joseph; Gerdes, Paul E.; and Singer, Roy W., to Polar Ware Company. Incinerator toilet. 3,789,434, Cl. 4-131.000.

Volz, Hermann, to Allweiler AG. Unitary pump-motor assembly. 3,790,309, Cl. 417-368.000.

Wadensten, Theodore S. Rotating pneumatic vibrator. 3,790,137, Cl. 259-1.00r.

Wagers William O.: *See—*
Prappier, Robert H.; Tanner, Hal W., Jr.; and Wagers William O., 3,790,399.

Wagner, Edgar R.; and Gould, Charles W. Polyamide resin-dye compositions and methods of making the same. 3,790,512, Cl. 260-14.000.

Wahborg, Harold J., to Copolymer Rubber & Chemical Corporation. Asphaltic-plastomeric composition. 3,790,519, Cl. 260-28.5as.

Wahle, Gunter, to Hauni-Werke Korber & Co., KG. Transporting apparatus for filter rod sections or the like. 3,789,744, Cl. 93-1.00c.

Wainio, Allan C.: *See—*
Hobart, William M.; and Wainio, Allan C., 3,790,325.

Wald, Milton M.: *See—*
Loth, Rene A.; and Wald, Milton M., 3,790,469.

Waldenmeier, Gunter: *See—*
Hempelmann, Wilhelm; Waldenmeier, Gunter; and Kienhofer, Manfred, 3,790,128.

Waldron, David W., to Lowndes Engineering Co., Inc. Tube and pipe cutting machine. 3,790,144, Cl. 266-23.00e.

Walker, Darrell W., to Phillips Petroleum Company. Oxidative dehydrogenation catalyst. 3,790,500, Cl. 252-437.000.

Walker, Darrell W., to Phillips Petroleum Company. Oxidative dehydrogenation catalyst. 3,790,501, Cl. 252-437.000.

Walsh, Rosemarie, nee Vossing: *See—*
Gibiani, Heinz; Kiesluch, Klaus; Koch, Hans-Joachim; Kosmol, Horst; Rufer, Clemens; Schroder, Eberhard; and Walsh, Rosemarie, nee Vossing, 3,790,445.

Walter, William M., Jr.; and Purcell, Albert L., to United States of America, Agriculture. Water dispersible beta-carotene. 3,790,688, Cl. 426-380.000.

Wamser, Christian Albert: *See—*
Bruen, Charles Patrick; Wamser, Christian Albert; and Morgan, Thomas Richard, 3,790,456.

Wanamaker, John L.; Weber, Kenneth E.; and Hoch, Geraldine M., to Lockheed Aircraft Corporation. Corrosion protected anodized aluminum surfaces. 3,790,453, Cl. 204-35.00n.

Ward, James E.: *See—*
Roberts, Marvin E.; Cohn, Reuben J.; and Ward, James E., 3,789,638.

Ward, Wallace W. Apparatus for dispensing and mixing liquids. 3,790,029, Cl. 222-129.400.

Wareham, William W.: *See—*
Koerner, Ernest C.; Wareham, William W.; and Bisque, Donny R., 3,790,530.

Waring, Wilson Shaw, to Imperial Chemical Industries, Limited. Pyridoquinoline dicarboxylic acid derivatives. 3,790,577, Cl. 260-287.00r.

Warner & Swasey Company, The: *See—*
Schuman, Ralph Henry, 3,790,182.

Warner Swasey Asquith Limited: *See—*
Harkness, Leslie, 3,789,509.

Warner-Lambert Company: *See—*
Ciaffone, John T., 3,790,033.

Warren, Chris W.; and Warren, Evelyn J. Douche bag holder. 3,790,118, Cl. 248-311.000.

Warren, Evelyn J.: *See—*
Warren, Chris W.; and Warren, Evelyn J., 3,790,118.

Warren, Robert A., to McDonnell Douglas Corporation. Roller brake system. 3,789,960, Cl. 188-74.000.

Warwick, Edward H., to General Motors Corporation. Multiple chamber disc brake caliper assembly. 3,789,961, Cl. 188-345.000.

Wasel-Nielen, Horst Dieter; and Heyner, Gero, to Knapsack Aktiengesellschaft. Process for the continuous dearsenification of polyphosphoric acid. 3,790,661, Cl. 423-321.000.

Wasserman, Seymour; Cirulli, Albert; and Farrar, Edward A., to Industrial Acoustics Company, Inc. Ventilated acoustic structural panel. 3,789,747, Cl. 98-33.000.

Wastland Reclamation Corporation: *See—*
Grable, Donovan B., 3,790,213.

Watanabe, Ichiro: *See—*
Murayama, Keisuke; Toda, Toshimasa; Mori, Eiko; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Watanabe, Ichiro, 3,790,525.

Watanabe, Koichi, to Yoshida Kogyo Kabushiki Kaisha. Cam-lock slider. 3,789,466, Cl. 24-205.14a.

Waters, Delman C.: *See—*
Brooks, Jul W.; Waters, Delman C.; and Ciener, Paul J., 3,789,530.

Waters, Rodney A.: *See—*
Grove, Marvin H.; and Waters, Rodney A., 3,790,123.

Watrous, Willis: *See—*
Kurtin, Stephen; Anthony, Michael; and Watrous, Willis, 3,790,886.

Watts, Gerald Alfred, to Magnesium Elektron Limited. Wheel. 3,790,219, Cl. 310-63.0dd.

Way, Allan S.; and Hayman, William J., to Beckman Instruments, Inc. Total loop gain indicator for optical null spectrophotometer. 3,790,283, Cl. 356-89.000.

Way, Donald F.: *See—*
Way, Frederick L.; and Way, Donald F., 3,789,521.

Way, Frederick L.; and Way, Donald F. Fiber optic teaching aid display. 3,789,521, Cl. 35-43.000.

Waz, Edward M.: *See—*
Huboi, Robert W.; Palmer, Osmond F.; and Waz, Edward M., 3,790,275.

Weatherby/Nasco, Inc.: *See—*
Chase, Myron C., 3,789,518.

Weatherhead Company, The: *See—*
Kozulla, Robert E.; and Silagy, Richard J., 3,789,881.

Weaver, Max A.; and Straley, James M., to Eastman Kodak Company. Thiadiazolyl-azo-phenyl or tetrahydroquinoline compounds. 3,790,557, Cl. 260-158.000.

Webb, Geoffrey A. M.; and Phykitt, Howard P., to Isotopes, Incorporated. Method and apparatus for treating thermoluminescent dosimeters during read-out to enable their immediate reuse. 3,790,784, Cl. 250-362.000.

Weber, Helmut: *See—*
Weyer, Rudi; Aumuller, Walter; Weber, Helmut; Muth, Karl; and Schmidt, Felix Helmut, 3,790,630.

Weber, Joseph A., to Weber Marking Systems, Inc. Stencil construction. 3,789,756, Cl. 101-128.200.

Weber, Kenneth E.: *See—*
Wanamaker, John L.; Weber, Kenneth E.; and Hoch, Geraldine M., 3,790,453.

Weber Marking Systems, Inc.: *See—*
Weber, Joseph A., 3,789,756.

Webster Spring Co., Inc.: *See—*
Garceau, Harry A., 3,789,440.

Week, Nils P.: *See—*
Shellman, Carl E.; and Week, Nils P., 3,789,703.

Wehde, Heinz, to Teldix GmbH. Electrically actuated vehicle brake system. 3,790,225, Cl. 303-21.00f.

Weikert, Roy J. Packaging machine. 3,789,574, Cl. 53-63.000.

Weinstein, Richard, to International Telephone and Telegraph Corporation. Zone control valve assembly. 3,790,122, Cl. 251-11.000.

Weintraub, Lester, to Air Products and Chemicals, Inc. Carbon monoxide copolymers. 3,790,460, Cl. 204-159.230.

Weis, Siegfried K.: *See—*
Frost, Charles C.; and Weis, Siegfried K., 3,789,683.

Weisenberger, Lavern M.; and Biora, Julio L., to Richardson Chemical Company, The. Electrodeposition of copper from sulfur-free cyanide electrolytes using periodic reverse current. 3,790,451, Cl. 204-15.000.

Weiss, Anton George: *See—*
Traber, Walter; Hambock, Heinz; and Weiss, Anton George, 3,790,615.

Weiss, Bernard J.: *See—*
Anderson, Richard W.; Weiss, Bernard J.; and Hulley, Hubert E., 3,790,938.

Weiss, Martin Joseph: *See—*
Remers, William Alan; Gibs, Gabriel Joseph; and Weiss, Martin Joseph, 3,790,590.

Weiss, Sidney Matthew. Fitted contour no-iron sheet construction. 3,789,441, Cl. 5-334.000.

Weiss, Virgil W., to Monsanto Company. Production of amines and diamines. 3,790,634, Cl. 260-583.00n.

Weissmuller, Adam: *See—*
Tearne, David; and Weissmuller, Adam, 3,790,102.

Weissmuller, Adam, to Mosler Safe Company, The. Combined transmit and receive terminal for pneumatic tube system. 3,790,101, Cl. 243-19.000.

Weller, John J.: *See—*
Snelling, Charles D.; Andrews, Theodore E.; and Weller, John J., 3,790,320.

Wellman-Lord, Inc.: *See—*
Earl, Christopher B.; and Hughes, Fred, 3,790,660.

Wendt, Hans J.: *See—*
Helmcke, Conrad D.; and Wendt, Hans J., 3,790,780.

Wening Avionics, Inc.: *See—*
Wening, Richard R., 3,790,920.

Wening, Richard R., to Wening Avionics, Inc. Battery terminal connector and housing. 3,790,920, Cl. 339-116.00c.

Wenz, William. Takeout tong assembly. 3,790,205, Cl. 294-115.000.

Wenzel, Magdalena: *See—*
Mund, Konrad; Richter, Gerhard; and Wenzel, Magdalena, 3,790,410.

Werkzeugmaschinenfabrik Adolf Waldrich Coburg: *See—*
Neugebauer, Heinz, 3,789,956.

Wermuth, Camille Georges; and Cahn, Jean, to Synthelabo. Tetrahydro diazepinones and their preparation from hydrozines and 828-carbonylacids. 3,790,563, Cl. 260-239.30r.

Werner & Pfeiderer, Firma: *See—*
Schraft, Horst; and Mack, Horst, 3,789,516.

Werner, Eberhard: *See—*

Schmidt, Willi J.; Kornelli, Wolfgang; and Werner, Eberhard, 3,790,056.

Werz, Siegfried; and Zanner, Johann, Jr., to Agfa-Gevaert Aktiengesellschaft. Motion picture camera with fading means. 3,790,263, Cl. 352-91.000.

Westbrook, Virgil H. Pumping unit safety guard. 3,789,679, Cl. 74-41.000.

Westenkirshner, Frank A.; and Rempes, Paul E., Jr., to Champion Spark Plug Company. Spark plug. 3,790,842, Cl. 313-118.000.

Western Applied Research and Development Inc.: *See*—
Muraca, Raffaele F., 3,790,864.

Western Electric Company: *See*—
Cuthbert, John David; McMahon, Richard George; and Munro, David Farnham (said McMahon assor. to), 3,790,287.

Western Electric Company, Incorporated: *See*—
Heinz, Robert Alfred; and Gehrle, Robert Charles, 3,790,280.

Westinghouse Electric Corporation: *See*—
Kraft, Joseph K., 3,789,972.

Weston, Jasper B., Jr.: *See*—
Smith, Thomas D.; and Weston, Jasper B., Jr., 3,790,950.

Weston, Martin Andrew: *See*—
Chivers, Malcolm; Dawson, William Grant; Masterman, Paul Henry; and Weston, Martin Andrew, 3,790,941.

Westwood, Herbert Wilfred, to Darenth Weighing Equipment, Limited. Pneumatic pressure transmitting device. 3,789,873, Cl. 137-514.300.

Weyer, Rudi; Aumuller, Walter; Weber, Helmut; Muth, Karl; and Schmidt, Felix Helmut, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Benzenesulfonyl-ureas. 3,790,630, Cl. 260-553.0da.

Whalen, Kenneth R.: *See*—
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Moust, Daniel A., 3,789,846.

Wheatley, Carl Franklin, Jr., to RCA Corporation. Differential amplifier and bias circuit. 3,790,897, Cl. 330-30.00d.

Whelan, James E., to General Motors Corporation. Fluid powered air compressor. 3,790,310, Cl. 417-388.000.

Whirlpool Corporation: *See*—
Karklys, Joseph, 3,790,815.

White, Clark Woody: *See*—
Simms, Douglas Leon; Tolk, Norman Henry; and White, Clark Woody, 3,790,411.

White, Dean S.: *See*—
Rae, Jerry W.; and White, Dean S., 3,789,567.

White, Harmon, & Associates, Inc.: *See*—
Swinson, Weldon F., 3,790,285.

White, Matthew B.; and Gerber, Wesley Duane, to Philco-Ford Corporation. Electro-optically induced weak coupling of adjacent carbon dioxide laser modes. 3,790,901, Cl. 331-94.500.

White, Robert J., to Chevron Research Company. Hydrocracking process for producing lubricating oils. 3,790,472, Cl. 208-111.000.

White Tomkins, Limited: *See*—
Gardner, David Stanley John; and Morrell, John Anthony, 3,790,686.

Whitehall Electronics Corporation: *See*—
Callins, Harold I.; and Doster, William H., 3,789,502.

Whitehouse, Harper J.: *See*—
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 3,790,930.

Whitin Machine Works, Inc.: *See*—
Kieronski, John P., 3,789,598.

Whiting, E.B. & A.C., Company: *See*—
Cramton, Frank Richard, 3,790,655.

Whitman, Robert S. Illuminating attachments for vaginal speculum. 3,789,835, Cl. 128-18.000.

Whiton, Alfred Case: *See*—
Dohany, Julius Eugene; and Whiton, Alfred Case, 3,790,540.

Whittaker, Harold, to Carding Specialists Co., Limited. Yarn wrap detector assembly with butterfly type sensor and switch actuator. 3,790,728, Cl. 200-61.180.

Whittington, Robert C.: *See*—
Leon, Albert M.; and Whittington, Robert C., 3,790,628.

Whorton, Robert B., III, to Beverage-Air Sales Company. Closure for refrigerated housing. 3,790,243, Cl. 312-214.000.

Whyte, Donald E.: *See*—
Thornton, James C.; and Whyte, Donald E., 3,790,081.

Wichita Engineering Co., Inc.: *See*—
Croft, W. Jack, 3,789,592.

Wichtel, Alejandro, to Yarway Corporation. Pilot-operated steam traps. 3,790,076, Cl. 236-54.00u.

Wickers Corporation, The: *See*—
Kendall, George A.; and Roseberry, Donald E., 3,789,709.

Wickum, Jay A.: *See*—
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Moust, Daniel A., 3,789,846.

Wideburg, Norman Earl: *See*—
Theriault, Robert John; Karwowski, James Paul; and Wideburg, Norman Earl, 3,790,578.

Widegren, Lars H.; and Keskitalo, Tage O. Noise dosimeter. 3,789,952, Cl. 181-.5ap.

Wiedenmann, Konrad; and Prelisauer, Peter, to Wieland-Werke AG. Device for applying an elongated ribbed strip to the exterior of a rotating conduit. 3,789,786, Cl. 113-1.00c.

Wieland-Werke AG: *See*—
Wiedenmann, Konrad; and Prelisauer, Peter, 3,789,786.

Wiers, Ward W.: *See*—
Gillham, Ronald F.; and Wiers, Ward W., 3,789,814.

Wildsmith, Eric, to Lilly Industries, Ltd. Production of erythromycylamine compounds. 3,790,559, Cl. 260-210.00e.

Wilk, Stanley H., to General Electric Company. Transport vehicle for long loads having limited lateral roadway clearance. 3,789,774, Cl. 105-367.000.

Williams, Glenn C., to Massachusetts Institute of Technology. Burner and heat exchanger. 3,789,805, Cl. 122-235.00r.

Williams, Joseph M.: *See*—
Boyd, David C.; and Williams, Joseph M., 3,790,260.

Williams, Richard H., to General Motors Corporation. Automatic shift for a transmission. 3,789,698, Cl. 74-752.00c.

Willits, Samuel P.: *See*—
Mohan, William L.; and Willits, Samuel P., 3,790,759.

Willoteaux, Guy C., to Societe Francaise d'Equipements pour la Nanigation Aerienne. Differential and disconnectible electronic circuit system. 3,790,763, Cl. 235-150.100.

Wilson, Ben F., to United States of America, Army. Propellant splash plate having flow directing means. 3,790,088, Cl. 239-432.000.

Wilson, David A.: *See*—
James, Robert C.; Wilson, David A.; and Pringle, Frank E., Jr., 3,789,888.

Wilson, Edward L.: *See*—
Fiocco, Robert J.; and Wilson, Edward L., 3,790,467.

Wilson, Elinor M. Power rake. 3,789,590, Cl. 56-14.700.

Wilson, Joseph R. Internally supported thin walled duct. 3,789,885, Cl. 138-103.000.

Windmoller & Holscher: *See*—
Peters, Rudolf, 3,789,713.

Winiershoff, Werner: *See*—
Bortfeld, Manfred; and Winiershoff, Werner, 3,789,949.

Winkler, Charles. Auxiliary rear view mirror. 3,790,117, Cl. 248-241.000.

Winter, Charles M. Trailer hitch for passenger motor vehicle. 3,790,189, Cl. 280-423.00r.

Wirz, Herbert A. Apparatus for compressing refuse. 3,789,752, Cl. 100-98.00r.

Wise, Mark J., to Flexicore Co., Inc., The. Composite slab casting form. 3,790,120, Cl. 249-50.000.

Wiss, J., & Sons Co.: *See*—
Rogers, Fred A.; and Berend, David, 3,790,810.

Wisyanski, Thomas William; and Northrop, Richard Alfred, Jr., to Scovill Manufacturing Company. Temperature-sensitive bleed valve. 3,790,077, Cl. 236-101.000.

Witco Chemical Corporation: *See*—
Bluestein, Claire; Rosenblatt, William; and Clark, John R., 3,790,602.

Witt, William W.: *See*—
Dukes, Lee R.; and Witt, William W., 3,790,957.

Witte, Josef: *See*—
Lehnert, Gunther; Maertens, Dieter; and Witte, Josef, 3,790,543.
Schon, Nikolaus; Pampus, Gottfried; and Witte, Josef, 3,790,546.

Witten, Arthur L., to General Motors Corporation. Gate-cathode power supply for a cycloconverter network of silicon controlled rectifiers. 3,790,873, Cl. 318-227.000.

Womack, William C.: *See*—
Berry, James M.; and Womack, William C., 3,789,812.

Wood, Dorin A.: *See*—
Farr, Alton E.; and Wood, Dorin A., 3,789,692.

Wood, Robert F., to Round-Eight Corporation. Square circle house or like building structure. 3,789,560, Cl. 52-236.000.

Wood, William G.: *See*—
Shoemaker, Robert H.; and Wood, William G., 3,790,489.

Wooddell, John H.: *See*—
Oldham, Robert R.; and Wooddell, John H., 3,789,986.

Woollard, Ronald Brian, to Price's Patent Candle Company, Limited. Liquid candles. 3,790,332, Cl. 431-126.000.

Wormly, Thaddues H. Toilet tissue roll storage device. 3,790,097, Cl. 242-55.530.

Wrinkle, Walter W.: *See*—
United States of America, National Aeronautics and Space Administration, 3,790,347.

Wyland, Alvin D., to General Electric Company. Switch control with lost motion actuator. 3,790,730, Cl. 200-153.00v.

Wyle Laboratories: *See*—
Masaitis, Theodore J., 3,789,958.

Wysocki, Joseph J.; Becker, James H.; and Dir, Gary A., to Xerox Corporation. A holding field to improve the image retention of a cholestering nematic phase transition liquid crystal imaging system. 3,790,251, Cl. 350-160.0lc.

Xerox Corporation: *See*—
Donohue, James M., 3,790,270.
Donohue, James M., 3,790,271.
Hatzmann, John F.; and Miller, Donald P., 3,790,159.
Hostetter, Joseph A., 3,790,288.
Hruschak, Joseph P.; and Ellis, George R., 3,790,958.
Klavsons, Uldis; and Michaels, Thomas B., 3,790,747.
Madrid, Robert W., 3,789,796.

Sato, Masamichi; and Tamai, Yasuo, 3,790,485.
Summers, James E.; and Elwood, Michael J., 3,790,158.
Wysocki, Joseph J.; Becker, James H.; and Dir, Gary A., 3,790,251.

Yabor, Enrique M., 50% to Moliver, David. Tire inflation valve with pressure indicator. 3,789,867, Cl. 137-227.000.

Yagi, Yoshiharu; Kobayashi, Akira; and Sato, Hiroshi, to Sumitomo Chemical Company, Limited. Process for producing butadiene polymer. 3,790,551, Cl. 260-94.300.

Yamada, Humio: *See—*
Saito, Yoshiomi; Sasaki, Hiroshi; Yamaguchi, Mamoru; Fukuda, Hide; Yamada, Humio; and Kimura, Koji, 3,790,524.

Yamada, Michiko: *See—*
Irikura, Tsutomu; Kasuga, Kazunori; Hashizume, Taeko; Ohasi, Mitsuo; Yuge, Masuo; and Yamada, Michiko, 3,790,586.

Yamaguchi, Mamoru: *See—*
Saito, Yoshiomi; Sasaki, Hiroshi; Yamaguchi, Mamoru; Fukuda, Hide; Yamada, Humio; and Kimura, Koji, 3,790,524.

Yamamoto, Etsuo: *See—*
Kominami, Naoya; Tamura, Nobuhiro; Mikami, Hiroshi; and Yamamoto, Etsuo, 3,790,642.

Yamamoto, Takuji: *See—*
Sakai, Hiroshi; Igarashi, Kazuo; Yamamoto, Takuji; and Matsuo, Normichi, 3,790,406.

Yamamura, Nobuyuki: *See—*
Tanimura, Shigeru; Miura, Nobuaki; Asano, Usamu; and Yamamura, Nobuyuki, 3,790,869.

Yamasaki, Kim: *See—*
Fick, Bernard E.; and Yamasaki, Kim, 3,789,821.

Yamashita, Hiroshi: *See—*
Hashiue, Masakazu; Yamashita, Hiroshi; and Sekikawa, Nobuyoshi, 3,790,376.

Yamashita, Noriyuki: *See—*
Shimizu, Kunio; Tamaki, Isao; and Yamashita, Noriyuki, 3,790,896.

Yamasue, Koutarou: *See—*
Shiba, Keisoke; Hinata, Masanao; Yamasue, Koutarou; Sato, Akira; and Ikeda, Tadashi, 3,790,390.

Yanes, Ralph S., 20% to Lee, Raymond, Organization, Inc., The. Ice box for beer barrel. 3,789,622, Cl. 62-396.000.

Yang, Chang-Tsing, to American Cyanamid Company. Process for the manufacture of vanillin from sulfite waste liquor. 3,790,637, Cl. 260-600.000.

Yankaitis, Thomas J. Electrical attachment for a fishing rod. 3,789,534, Cl. 42-19.200.

Yanke, Ronald C.: *See—*
Carson, Loren A.; Tremewan, R. S.; and Yanke, Ronald C., 3,789,893.

Yarway Corporation: *See—*
Wichtel, Alejandro, 3,790,076.

Yarwood, Peter H. Burglar alarm system. 3,790,944, Cl. 340-274.000.

Yasue, Teruo: *See—*
Hasada, Yoshiyasu; and Yasue, Teruo, 3,790,617.

Yeh, George C. Separation of a liquid containing charged particles or/and polarizable molecules. 3,790,461, Cl. 204-180.00r.

Yelpo, Joseph P.: *See—*
Cook, Albert N.; Goetz, Lawrence R.; Manley, Paul A.; and Yelpo, Joseph P., 3,789,783.

Yip, James K., to Rodman Industries, Inc. Rotatable locking supports for sashes of windows. 3,789,549, Cl. 49-181.000.

Yoakum, Marshall: *See—*
Garcia, Joe N., 3,789,429.

Yokohama Rubber Company, Limited, The: *See—*
Kobayashi, Takashi, 3,789,899.

Yorisue, Kazumi: *See—*
Inoue, Komei; Yorisue, Kazumi; and Akamatsu, Mitsuhiro, 3,789,968.

Yoshida Kogyo Kabushiki Kaisha: *See—*
Douri, Hisashi, 3,789,486.
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Yoshida, Yoshinobu: *See—*
Oishi, Yashushi; Yoshida, Yoshinobu; and Sano, Kazuya, 3,790,384.
Oishi, Yasushi; Sano, Kazuya; and Yoshida, Yoshinobu, 3,790,379.

Yoshitomi Pharmaceutical Industries, Ltd.: *See—*
Nakanishi, Michio; Arimura, Katsuo; and Ao, Hideki, 3,790,579.

Yoshiyasu, Mitsuo: *See—*
Tanba, Shigeru; Yoshiyasu, Mitsuo; and Miyabe, Yoshio, 3,790,435.

Young, James E.: *See—*
Sternberg, Stanley R.; Young, James E.; and Lennington, John W., 3,790,797.
Sternberg, Stanley R.; Young, James E.; and Lennington, John W., 3,790,798.

Young Rubber Co.: *See—*
Susin, Victor G., 3,790,324.

Young, William O., Jr.; and Quattlebaum, Walter J., to Deering Milliken Research Corporation. Pull tab apparatus. 3,790,424, Cl. 156-379.000.

Ythier, Jean-Pierre: *See—*
Doittau, Francois-Xavier; Ythier, Jean-Pierre; and Hebert, Marcel, 3,790,890.

Yuge, Masuo: *See—*
Irikura, Tsutomu; Kasuga, Kazunori; Hashizume, Taeko; Ohasi, Mitsuo; Yuge, Masuo; and Yamada, Michiko, 3,790,586.

Yusawa, Motoyasu: *See—*
Koizumi, Masaharu; and Yusawa, Motoyasu, 3,790,517.

Zamyshlyaeva, Lidia Ionovna: *See—*
Suvorov, Nikolai Nikolaevich; Avramenko, Vladimir Grigorievich; Shkilkova, Valentina Nikolaevna; and Zamyshlyaeva, Lidia Ionovna, 3,790,596.

Zandleven Curacao N.V.: *See—*
Kijkstra, Waling, 3,790,398.

Zanner, Johann, Jr.: *See—*
Werz, Siegfried; and Zanner, Johann, Jr., 3,790,263.

Zaugg, Poland, to Schild, A., S.A. Frictional coupling device for watch movement. 3,789,691, Cl. 74-432.000.

Zbikowski, Theodore H.: *See—*
Good, Thomas W.; and Zbikowski, Theodore H., 3,789,541.

Zeitler, Gerhard: *See—*
Trieschmann, Hans-Georg; Pfanmueller, Helmut; and Zeitler, Gerhard, 3,790,548.

Zelder, Felix: *See—*
Riedel, Rudolf; Zelder, Felix; and Gilles, Horst, 3,789,889.
Riedel, Rudolf; and Zelder, Felix, 3,789,890.

Zemanek, Elena: *See—*
Zemanek, Rudolph; and Zemanek, Elena, 3,790,074.

Zemanek, Rudolph; and Zemanek, Elena. Universal unit-converting slide rule. 3,790,074, Cl. 235-89.00r.

Zemann, Egon: *See—*
Slamecka, Ernst; Kapitany, Hans; and Zemann, Egon, 3,790,732.

Zenith Radio Corporation: *See—*
Dietch, Leonard, 3,790,839.
Kessler, Lawrence W.; and Korpel, Adrianus, 3,790,281.

Zettler, John F.; and Lazar, Walter A., to Instrumentation Laboratory, Inc. Calorimetry. 3,789,662, Cl. 73-190.00r.

Zeug, Hubert: *See—*
Koch, Friedrich; and Zeug, Hubert, 3,790,136.

Ziegler, Reinhold, to International Standard Electric Corporation. System for fault detection and location on data lines. 3,790,769, Cl. 235-153.0ak.

Zifferer, Morton F.; and Flinchbaugh, Donald E., to Mordo Company. Machine for assembling tubes in a heat exchanger. 3,789,479, Cl. 29-202.00r.

Zmijewski, Chester M.: *See—*
Luciano, Robert A.; Zmijewski, Chester M.; and Borden, Gustav V., 3,790,048.

Zoch, Robert M., Jr.: *See—*
Stephenson, Robert A.; and Zoch, Robert M., Jr., 3,790,139.

Zosel, Thomas W.: *See—*
La Perre, James D.; Dyrud, James F.; and Zosel, Thomas W., 3,790,439.

Zot Manufacturing Company: *See—*
Lenhart, Ronald A.; and Rickard, Timothy W., 3,790,167.

Zuber, Bretislav Paul: *See—*
Iyengar, Rama; and Zuber, Bretislav Paul, 3,789,480.

Zucconi, Homer R. Keg tapping assembly. 3,790,039, Cl. 222-394.000.

Zundel, Jean Louis. Preparation of α-aminoacids from hydantoins. 3,790,599, Cl. 260-326.14t.

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LIST OF DEFENSIVE PUBLICATIONS

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Bond, Gary L. Process for preparing a flame resistant, heat transfer printed fabric. T919,004, 2–5–74, Cl. 117—36.2.

Heckendorn, Frank M., II. Automatic control for tow dryers. T913,003, 2–5–74, Cl. 34—55

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Person, Lucien. Mixed acetals and process for their preparation. T919,001, 2–5–74, Cl. 260—615.

Rose, John B., and I. C. Taylor, to Imperial Chemical Industries Ltd. Aromatic sulphones produced by oxidation of aromatic polymers. T919,002, 2–5–74, Cl. 260—49.

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Biomedical Engineering Associates, Inc.: *See*—
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Huber, Robert, to Societe des Procedes Modernes d'Injection Sopromi. Fuel injection system for internal combustion engines. Re. 27,909, 2–5–74, Cl. 123—32.

Hutcheson, James L., to Reynolds Metals Co. Easy open pouch construction. Re. 27,913, 2–5–74, Cl. 229—66.

King, John C., to Concrete Formwork Engineers Pty., Ltd. Scissors-type linkage. Re. 27,914, 2–5–74, Cl. 182—16.

Kohl, Gerald C., to Medics Research and Development Inc. Cervical biopsy sampling instrument. Re. 27,915, 2–5–74, Cl. 128—2.

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Miller, Howard A., to Eastman Kodak Co. Scum-retardant carrier particles and compositions thereof. Re. 27,912, 2–5–74, Cl. 252—62.100.

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Byrum, Roy L., to Joseph H. Hill Co. Pink rose plant. 3,464, 2–5–74, Cl. 18.

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Byrum, Roy L., to Joseph H. Hill Co. Rose plant. 3,468, 2–5–74, Cl. 26.

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210R 3,789,452
237 3,789,453

CLASS 16
128R 3,789,455

CLASS 17
1R 3,789,456
21 3,789,458
48 3,789,457
52 3,789,459
73 3,789,460

CLASS 19
.35 3,789,461

CLASS 23
230R 3,790,345
253PC 3,790,347
253R 3,790,346
254EF 3,790,348
284 3,790,349
288F 3,790,350

CLASS 24
20CW 3,789,463
68CT 3,789,464
205.1C 3,789,465
205.14A 3,789,466
230AL 3,789,492
230AT 3,789,467

CLASS 26
62 3,789,468

CLASS 28
72.6 3,789,469

CLASS 29
25.13 3,789,470
25.17 3,789,471
155R 3,789,474
159.02 3,789,475
163.5R 3,789,476
182 3,790,351
182.1 3,790,352
182.7 3,790,353
191 3,790,354
195 3,790,355
200P 3,789,477
201 3,789,478
3,790,356
202R 3,789,479
203B 3,789,483
203C 3,789,480
203D 3,789,482
3,789,485
203H 3,789,484
203P 3,789,481
207.5SL 3,789,487
207.5ST 3,789,486
208C 3,789,489
208D 3,789,488
211R 3,789,490
212R 3,789,491
282 3,789,493
423 3,789,494
429 3,789,495
453 3,789,496
3,789,497
470.9 3,789,498
472.9 3,789,499
568 3,789,472
3,789,473
3,789,500
3,789,501
570 3,789,502
571 3,789,503
3,789,504
603 3,789,505

CLASS 32
27 3,789,506
59 3,789,462

CLASS 33
1SD 3,789,507
148D 3,789,508
185R 3,789,509
306 3,789,510
312 3,789,511
393 3,789,512

CLASS 34
10 3,789,513
82 3,789,514
92 3,789,515
216 3,789,516

CLASS 35
9E 3,789,517
17 3,789,518
19R 3,789,519
43 3,789,521
48A 3,789,520
60 3,789,522

CLASS 36
2.5AH 3,789,523

CLASS 37
118R 3,789,524

CLASS 40
28C 3,789,525
124 3,789,526
3,789,530
152 3,789,527
3,789,528
158R 3,789,529

CLASS 42
87 3,789,531

CLASS 43
14 3,789,532
18R 3,789,533
19.2 3,789,534
22 3,789,535
42.5 3,789,536
112 3,789,537

CLASS 44
3R 3,790,357
62 3,790,358
3,790,359

CLASS 46
1K 3,789,542
1R 3,789,543
12 3,789,538
41 3,789,544
62 3,789,545
116 3,789,546
135A 3,789,539
158 3,789,547
202 3,789,540
215 3,789,541

CLASS 49
162 3,789,548
181 3,789,549
503 3,789,550

CLASS 51
92R 3,789,551
135BT 3,789,552
237T 3,789,553
274 3,789,554
391 3,789,555

CLASS 52
93 3,789,556
126 3,789,557
127 3,789,564
143 3,789,558
169 3,789,559
236 3,789,560
282 3,789,567
456 3,789,561
573 3,789,566
648 3,789,562
731 3,789,563
747 3,789,565
3,789,568

CLASS 53
28 3,789,569
29 3,789,570
54 3,789,571
55 3,789,573
63 3,789,574
160 3,789,575
234 3,789,576
381A 3,789,572

CLASS 55
39 3,789,578
42 3,789,577
50 3,789,579
71 3,789,580
73 3,789,581
92 3,789,582
171 3,789,583
201 3,789,584
222 3,789,585
228 3,789,586
290 3,789,587
419 3,789,588
481 3,789,589

CLASS 56
14.7 3,789,590
16.9 3,789,591
328R 3,789,592
341 3,789,593

CLASS 57
10 3,789,594
34R 3,789,595
55 3,789,596
58.89 3,789,597
71 3,789,598

CLASS 58
23R 3,789,599
39.5 3,789,600
50R 3,789,601
58 3,789,602
3,789,603
59 3,789,604
88R 3,789,605
90R 3,789,606

CLASS 59
84 3,789,607

CLASS 60
202 3,789,608
219 3,789,609
245 3,789,610
566 3,789,611

CLASS 61
1R 3,789,613
1 3,789,612
11 3,789,615
72.6 3,789,614

CLASS 62
50 3,789,616
115 3,789,617
236 3,789,618
262 3,789,619
324 3,789,621
344 3,789,620
396 3,789,622

CLASS 64
17 3,789,623
21 3,789,624
3,789,625
3,789,626
31 3,789,627

CLASS 65
27 3,789,628
32 3,790,360
99A 3,790,361
174 3,790,362

CLASS 66
50R 3,789,629
78 3,789,630
163 3,789,631

CLASS 69
42 3,789,632

CLASS 70
110 3,789,633
186 3,789,634
232 3,789,635
252 3,789,636
299 3,789,637
366 3,789,638
437 3,789,639

CLASS 71
106 3,790,363
120 3,790,364

CLASS 72
36 3,789,640
45 3,789,641
60 3,789,642
190 3,789,646
236 3,789,647
316 3,789,648
350 3,789,649
360 3,789,650
367 3,789,651
407 3,789,689
457 3,789,652
469 3,789,643
3,789,644

CLASS 73
6 3,789,653
15R 3,789,654
24 3,789,655
71.5U 3,789,656
88R 3,789,657
117.3 3,789,658
134 3,789,659
169 3,789,660
178T 3,789,661
190R 3,789,662
194C 3,789,663
209 3,789,664
343R 3,789,665
398R 3,789,666
406 3,789,667
418 3,789,668
419 3,789,669
421R 3,789,670
423R 3,789,671
491 3,789,672
505 3,789,673
517R 3,789,674

CLASS 74
5.7 3,789,677
18.2 3,789,675
27 3,789,676
41 3,789,679
89 3,789,678
102 3,789,680
143 3,789,681
230.17D 3,789,684
230.7 3,789,682
230.8 3,789,683
242.13A 3,789,686
242.3 3,789,685
243DR 3,789,687
365 3,789,688
411 3,789,690
432 3,789,691
480R 3,789,692
491 3,789,645
513 3,789,693
531 3,789,694
568R 3,789,695
594.1 3,789,696
677 3,789,697
752C 3,789,698
796 3,789,699
801 3,789,700
813R 3,789,701
859 3,789,702
860 3,789,703

CLASS 75
20F 3,790,365
3,790,367
23 3,790,366
49 3,790,368
3,790,369
108 3,790,370
134F 3,790,372
146 3,790,373
170 3,790,371
208R 3,790,374

CLASS 81
9.2 3,789,704
13 3,789,705
57.29 3,789,706
57.39 3,789,707

CLASS 82
5.5 3,789,708
9 3,789,709

CLASS 83
16 3,789,710
61 3,789,711
171 3,789,712
184 3,789,713
272 3,789,714
663 3,789,715
747 3,789,716
796 3,789,717

CLASS 84
1.01 3,789,718
3,790,693
115 3,789,719
322 3,789,720
380A 3,789,721
426 3,789,722
470 3,789,723

CLASS 85
32V 3,789,724
47 3,789,725
62 3,789,726
71 3,789,727
3,789,728

CLASS 89
1.8 3,789,729
183 3,789,730

CLASS 90
11R 3,789,731
13.6 3,789,732
14 3,789,733
24B 3,789,734

CLASS 91
1 3,789,735
3 3,789,736
168 3,789,738
358A 3,789,739
416 3,789,737
486 3,789,740
488 3,789,741

CLASS 92
26 3,789,742
187 3,789,743

CLASS 93
1C 3,789,744
8R 3,789,745
39.2 3,789,746
125 3,790,390

CLASS 96
1R 3,790,375
27 3,790,376
35.1 3,790,377
48PD 3,790,380
48R 3,790,378
55 3,790,379
66.1 3,790,381
66.4 3,790,383
74 3,790,384
75 3,790,382
3,790,385
94R 3,790,386
94 3,790,387
100 3,790,388
115R 3,790,389

CLASS 98
33 3,789,747

CLASS 99
171LP 3,790,684
330 3,790,391
340 3,789,748
391 3,789,749
536 3,789,750

CLASS 100
19R 3,789,751
98R 3,789,752

CLASS 101
1 3,789,753
37 3,789,754
95 3,789,755
128.2 3,789,756
153 3,789,757

CLASS 102
13 3,789,758
23 3,789,759
24HC 3,789,760
27R 3,789,761
28R 3,789,762
49.2 3,789,763
70R 3,789,764

CLASS 104
96 3,789,765
172BT 3,789,767
172B 3,789,766
279 3,789,768

CLASS 105
164 3,789,769
168 3,789,770
199C 3,789,771
240 3,789,772
248 3,789,773
367 3,789,774
3,789,775
377 3,789,776

CLASS 106
1 3,790,392
56 3,790,393
97 3,790,394
122 3,790,395
288B 3,790,396

CLASS 108
4 3,789,777
94 3,789,778
101 3,789,779

CLASS 110
1A 3,789,780

CLASS 112
121.29 3,789,781
130 3,789,782
220 3,789,783
246 3,789,784

CLASS 113
1C 3,789,786
1G 3,789,785
116R 3,789,787

CLASS 114
16A 3,789,788
66.5H 3,789,789
106 3,789,790
227 3,789,791

CLASS 115
6.1 3,789,792

CLASS 116
114R 3,789,793

CLASS 117
17.5 3,790,397
37R 3,790,398
44 3,790,399
47A 3,790,400
59 3,790,401
68 3,790,402
76T 3,790,403
106R 3,790,404
201 3,790,405

227 3,790,406
240 3,790,407

CLASS 118

7 3,789,794
262 3,789,795
612 3,789,796

CLASS 119

1 3,789,797
14.08 3,789,798
15 3,789,799
18 3,789,800
29 3,789,801
48 3,789,802

CLASS 122

1R 3,789,804
235R 3,789,805
406B 3,789,806

CLASS 123

1R 3,789,807
8.05 3,789,809
27GE 3,789,820
32EA Re.27,909
71R 3,789,808
102 3,789,810
117A 3,789,811
3,789,812
119F 3,789,813
3,789,814
3,789,815
119R 3,789,816
133 3,789,817
139AM 3,789,818
140MP 3,789,819

CLASS 126

33.9 3,789,826
38 3,789,821
41R 3,789,822
42 3,789,823
59.5 3,789,824
140 3,789,825
344 3,789,827

CLASS 128

1R 3,789,828
2B Re.27,915
2F 3,789,830
2R 3,789,832
2V 3,789,833
2.05F 3,789,831
2.05 3,789,841
2.1Z 3,789,834
18 3,789,835
25B 3,789,836
102 3,789,829
130 3,789,838
142.7 3,789,839
145.8 3,789,837
165 3,789,842
173 3,789,843
235 3,789,844
260 3,789,840
264 3,789,845
283 3,789,846
303R 3,789,847
305 3,789,848
323 3,789,849
329 3,789,850
335 3,789,851
347 3,789,852
349B Re.27,910
399 3,789,853
419P 3,789,854

CLASS 131

9 3,789,855

CLASS 132

92R 3,789,859
880.007 3,789,857
880.5 3,789,856
890 3,789,858

CLASS 134

104 3,789,860
166C 3,789,861

CLASS 136

13 3,790,408
20 3,790,409
122 3,790,410

CLASS 137

54 3,789,863
119 3,789,864
122 3,789,865
150 3,789,862
219 3,789,866
227 3,789,867
317 3,789,868
351 3,789,869
454.5 3,789,870
493.002 3,789,871
514 3,789,872
514.003 3,789,873
527 3,789,874
553 3,789,875
554 3,789,876
590 3,789,877
3,789,878
614.11 3,789,879
625.3 3,789,880
625.48 3,789,881
802 3,789,882
824 3,789,883
832 3,789,884

CLASS 138

103 3,789,885
146 3,789,886

CLASS 139

123 3,789,887

CLASS 141

4 3,789,888
140 3,789,889
144 3,789,890
331 3,789,891

CLASS 144

144.5 3,789,892
208E 3,789,893
288A 3,789,894

CLASS 145

46 3,789,895
54 3,789,896

CLASS 148

1.5 3,790,411
3,790,412
16.5 3,790,413
31.57 3,790,414

CLASS 149

2 3,790,415
19 3,790,416

CLASS 150

11 3,789,897

CLASS 152

209 3,789,898
356 3,789,899
3,789,900

CLASS 156

62.8 3,790,417
79 3,790,418
149 3,790,419
242 3,790,421
251 3,790,420
306 3,790,422
331 3,790,423
379 3,790,424
416 3,790,425
435 3,790,426
544 3,790,427
559 3,790,428
584 3,790,429

CLASS 157

1.1 3,789,901

CLASS 159

49 3,789,902

CLASS 160

75 3,789,903
120 3,789,904
168 3,789,905
199 3,789,906

CLASS 161

1 3,790,430
3.5 3,790,431
93 3,790,432
113 3,790,433
160 3,790,435
161 3,790,436
167 3,790,439
170 3,790,437
172 3,790,438
181 3,790,434
198 3,790,441
3,790,442

CLASS 162

158 3,790,443

CLASS 164

7 3,789,907
52 3,789,908
82 3,789,911
87 3,789,909
121 3,789,910
243 3,789,912
283 3,789,913
339 3,789,914

CLASS 165

1 3,789,915
8 3,789,916
3,789,917
19 3,789,918
101 3,789,919
105 3,789,920

CLASS 166

55.1 3,789,923
105.1 3,789,924
125 3,789,925
224R 3,789,926
282 3,789,927
500 3,789,921
3,789,922

CLASS 172

709 3,789,928
798 3,789,929

CLASS 173

1 3,789,930
22 3,789,931
43 3,789,932
48 3,789,933
93.5 3,789,934

CLASS 174

23R 3,790,694
28 3,790,695
35MS 3,790,696
102 3,790,697
152R 3,790,698

CLASS 175

40 3,789,935
50 3,789,936

CLASS 177

210 3,789,937

CLASS 178

2A 3,790,699
5.1 3,790,700
5.4CD 3,790,701
5.4R 3,790,702
6.6R 3,790,703
6.8 3,790,704
7.1 3,790,705
3,790,706
7.2 3,790,707
17C 3,790,708
18 3,790,709
69.5DC 3,790,710

CLASS 179

1GP 3,790,711
1ST 3,790,712
15AL 3,790,717
15AT 3,790,713
15BS 3,790,716
15BT 3,790,714
15BV 3,790,715
17D 3,790,718
18AD 3,790,719
81R 3,789,803
84UF 3,790,720
90BB 3,790,722
90B 3,790,721
175.3 3,790,723
180 3,790,724

CLASS 180

5R 3,789,938
6.48 3,789,940
6.5 3,789,939
9.22 3,789,941
9.44 3,789,942
66R 3,789,943
68P 3,789,944
69R 3,789,945
79.2B 3,789,946
79.3 3,789,947
91 3,789,948
3,789,949
98 3,789,950

CLASS 181

.5VM 3,789,951
31B 3,789,953
33K 3,789,954
500AP 3,789,952

CLASS 182

16 Re.27,914
78 3,789,955

CLASS 184

6.12 3,789,956

CLASS 186

1AC 3,789,957

CLASS 187

8.49 3,789,958

CLASS 188

71.9 3,789,959
74 3,789,960
345 3,789,961
3,789,962

CLASS 191

29 3,790,725

CLASS 192

3.57 3,789,963
29 3,789,964
85V 3,789,965
111A 3,789,966
3,789,967

CLASS 194

1N 3,789,968

CLASS 195

47 3,790,444
51R 3,790,445
66R 3,790,446
103.5R 3,790,447

CLASS 197

17 3,789,970
18 3,789,971

CLASS 198

16R 3,789,972
19 3,789,973
20 3,789,974
180 3,789,975
219 3,789,976
220BC 3,789,977

CLASS 200

38B 3,790,726
61.18 3,790,728
61.49 3,790,727
61.88 3,790,729
153SC 3,790,731
153V 3,790,730
166BB 3,790,732
166J 3,790,733
168G 3,790,734

CLASS 201

39 3,790,448

CLASS 204

1T 3,790,449
14N 3,790,450
15 3,790,451
29 3,790,452
35N 3,790,453
49 3,790,454
51 3,790,455
61 3,790,456
96 3,790,458
99 3,790,457
157.1 3,790,459
159.23 3,790,460
163R 3,790,462
180R 3,790,461
195F 3,790,463
212 3,790,464
266 3,790,465
300 3,790,466

CLASS 208

8 3,790,467
10 3,790,468
3,790,469
58 3,790,470
111 3,790,471
3,790,472
139 3,790,473
181 3,790,474

CLASS 209

10 3,789,978
73 3,789,979
74R 3,789,980
78 3,789,981
80.5 3,789,982
111.6 3,789,983
505 3,789,984

CLASS 210

31C 3,790,475
47 3,790,476
3,790,477
77 3,789,985
121 3,789,986
232 3,789,987
242 3,789,988
284 3,789,989
310 3,789,990
317 3,789,991
405 3,789,992
500 3,789,993

CLASS 211

86 3,789,994
113 3,789,995
119 3,789,996

CLASS 212

11 3,789,997
125 3,789,998

CLASS 213

8 3,789,999

CLASS 214

1BD 3,790,001
1CM 3,790,002
1S 3,790,003
6H 3,790,004
16.4A 3,790,005
3,790,006
17D 3,790,007
63 3,790,008
152 3,790,009
3,790,010
302 3,790,011
454 3,790,012
674 3,790,013

CLASS 215

9 3,790,014
3,790,015
11E 3,790,017
112 3,790,016

CLASS 219

10.49 3,790,735
3,790,736
76 3,790,737
85 3,790,738
97 3,790,739
98 3,790,740
102 3,790,741
121LM 3,790,744
121P 3,790,742
130 3,790,743
203 3,790,745
213 3,790,746
216 3,790,747
219 3,790,748
424 3,790,749
444 3,790,750
522 3,790,752
525 3,790,751
528 3,790,753

CLASS 220

4C 3,790,018
16R 3,790,019
46R 3,790,020
63R 3,790,021

CLASS 221

2 3,790,022
77 3,790,024
200 3,790,025
211 3,790,026
274 3,790,027
304 3,790,023

CLASS 222

52 3,790,042
122.4 3,790,028
129.4 3,790,029
135 3,790,030
136 3,790,031
146HA 3,790,033
146 3,790,032
153 3,790,034
178 3,790,035
194 3,790,036
324 3,790,037
386 3,790,038
390 3,790,048
394 3,790,039
413 3,790,040

CLASS 223

46 3,790,041
61 3,790,043
86 3,790,044
87 3,790,045
92 3,790,046
112 3,790,047

CLASS 224

45P 3,790,049
3,790,050

CLASS 225

1 3,790,051
2 3,790,052
48 3,790,053
93.5 3,790,054
3,790,055
174 3,790,056
195

CLASS 227

19 3,790,057

CLASS 228

1 3,790,059
2 3,790,058
3 3,790,060

CLASS 229

2.5 3,790,061
3,790,062
29M 3,790,063
39R 3,790,064
40 3,790,065
52B 3,790,066
55 3,790,067
66 Re.27,913
69 3,790,068
87R 3,790,069
92.8 3,790,070

CLASS 234

1 3,790,071

CLASS 235

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PLANT PATENTS

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DEFENSIVE PUBLICATIONS APPLICATIONS

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17 : T919,001
45 : T919,003
47 : T919,004

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Frederick B. Dent, *Secretary*